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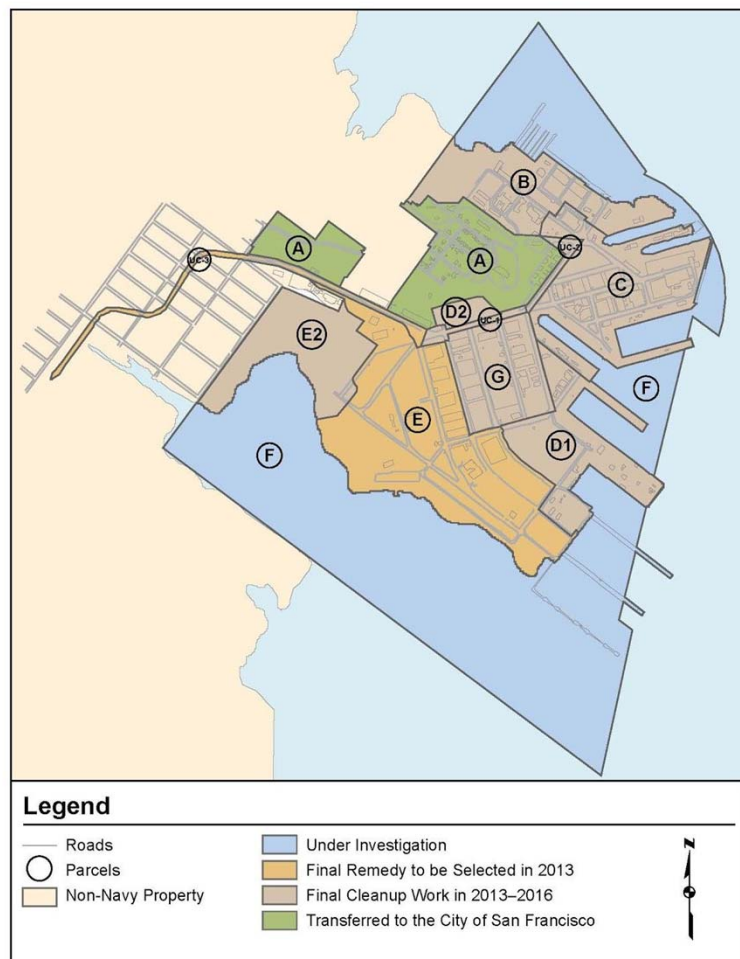
# **Clean up at Hunters Point Naval Shipyard**

Presented by:  
Maria Caine, Lucien Martin, Flora Lu,  
and Daniel Hirsch

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Program on Environmental and Nuclear Policy  
College 10 - University of California, Santa Cruz



# Introduction

1940 - Navy owns shipyard

1946 - United States' Naval Radiological Defense Laboratory

1974 - Triple A Machine Shop, Inc.

Triple A Machine Shop was indicted and convicted for illegal disposal of hazardous substances at Hunters Point.

1989 - EPA placed the Shipyard on its National Priority List

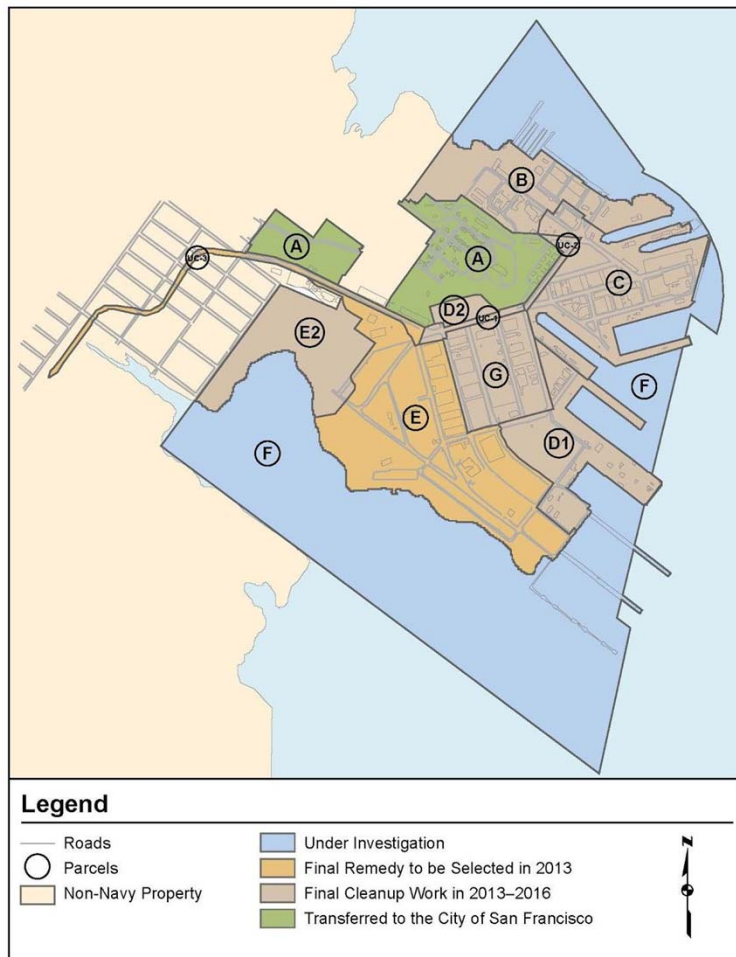
## 27 years ago

# Introduction

What is an EPA Superfund site?

Who holds responsibility?

Navy, EPA, DTSC, and San Francisco



# Key Findings

Superfund law requires Hunters Point must be cleaned up consistent with EPA Superfund guidance

Cleanup has been using standards that violate this requirement and are substantially less protective

The public is therefore potentially exposed to greater risks than would be the case if the law had been followed

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## Key Findings

The Navy is using a standard of 25 millirem per year, the equivalent of the public receiving 12 additional chest x-rays each year

**EPA either didn't catch this or allowed it to happen**

---

# Key Findings

The Navy is using a 42 year old regulatory guide from the Atomic Energy Commission which **no longer exists**

EPA says the guide is not to be used

**EPA either didn't catch this or allowed it to happen**

---

## Key Findings

The Navy is shipping out for recycle and disposal, waste with radioactive contamination to sites not licensed or designed to receive it

**EPA either didn't catch this or allowed it to happen**

---

# Key Findings

Navy is using RESRAD model even though EPA guidance requires the use of its Calculator

**EPA either didn't catch this or allowed it to happen**

---



## Key Findings

Navy says it is using EPA preliminary remediation goals as its cleanup standards, but it is using them from 1991-**a quarter of a century old**- rather than current PRGs

**EPA either didn't catch this or allowed it to happen**

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# Results

The Hunters Point cleanup standards are far more lax than EPA's current remediation goals recommend.

Sometimes 100s of times more lax

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# Tetra Tech: False Samples

April 2014 Tetra Tech was caught Red-Handed

“Deliberately Falsified Radiation Readings” - NRC

Can any Tetra Tech measurements then be trusted?



Tetra Tech continues working.

This means they continue work even after being caught.

How could this be considered safe?

THE  
INVESTIGATIVE UNIT

NBC  
BAY AREA



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION I  
2100 RENAISSANCE BLVD., SUITE 100  
KING OF PRUSSIA, PA 19406-2713

February 11, 2016

Docket No. 03038199  
EA-15-230

License No. 29-31396-01

Andrew N. Bolt  
President  
Tetra Tech EC, Inc.  
1000 The American Road  
Morris Plains, New Jersey 07950

SUBJECT: NRC OFFICE OF INVESTIGATIONS REPORT NO. 1-2014-018

Dear Mr. Bolt:

This letter refers to an investigation conducted by the U.S. Nuclear Regulatory Commission (NRC) Office of Investigations (OI) between April 29, 2014, and September 17, 2015, to determine, in part, whether employees of Tetra Tech EC, Inc. (Tetra Tech), deliberately falsified soil sample surveys from the area referred to as 'Parcel C' at the U.S. Navy's Hunter's Point Naval Shipyard (HPNS) in San Francisco, California. A Factual Summary of OI Investigation Report No. 1-2014-018 is enclosed (Enclosure 1) with this letter.

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The RTS, who was responsible for monitoring the work the technicians performed in the field, testified to OI that, on approximately 10 to 15 occasions, he deviated from where the engineers instructed the technicians to dig without following protocol. However, the RTS stated that this was done to avoid obstructions (e.g., utility lines, buildings) within the specified area. Although the RTS denied obtaining samples from unspecified locations in order to obtain lower contamination levels, he confirmed that he had signed two chain-of-custody forms for samples that the licensee determined had anomalously low levels for the specified location. OI concluded that the evidence supported that the samples were obtained from a location other than the one specified.

Based on the evidence gathered during the OI investigation, it appears that the RCT and RTS had deliberately falsified soil sample surveys of the HPNS Parcel C.

The NRC, which is known to be lax, found Tetra Tech's behavior to warrant investigation and intervention.

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## CERCLA 120(a)(2)

“No department, agency, or instrumentality of the United States may adopt or utilize any such guidelines, rules, regulations, or criteria which are inconsistent with the guidelines, rules, regulations, and criteria established by the Administrator under this chapter.”

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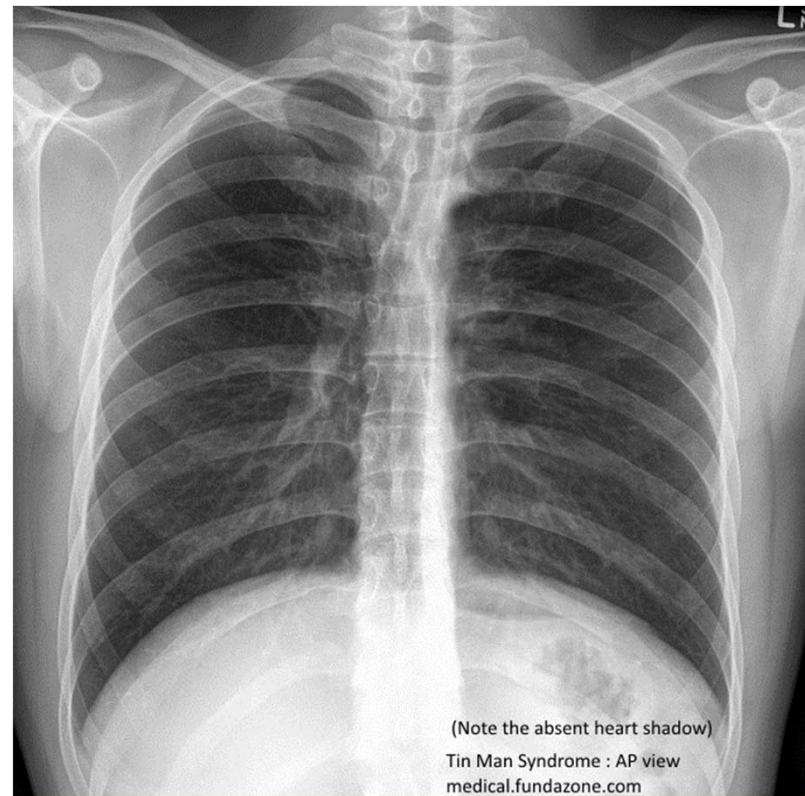
# It's time for your Monthly Check Up

25 mrem/yr = 1 chest x-ray/month

Does this feel safe?

Is this necessary?

Can you live like this?



# Old Guides

AEC Regulatory Guide 1.86 (**1974**)

How trustworthy is a **42 year old** guide?



This guide is so outdated, that the agency which issued it no longer even **exists!**

EPA says that the guidance is not to be used, and yet the Navy is using it.

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# It's Trash Day: But where does

Transportation of waste  
concerns

Standards for Waste Removal

Problems with Navy  
Transparency



# The Mess is Spreading

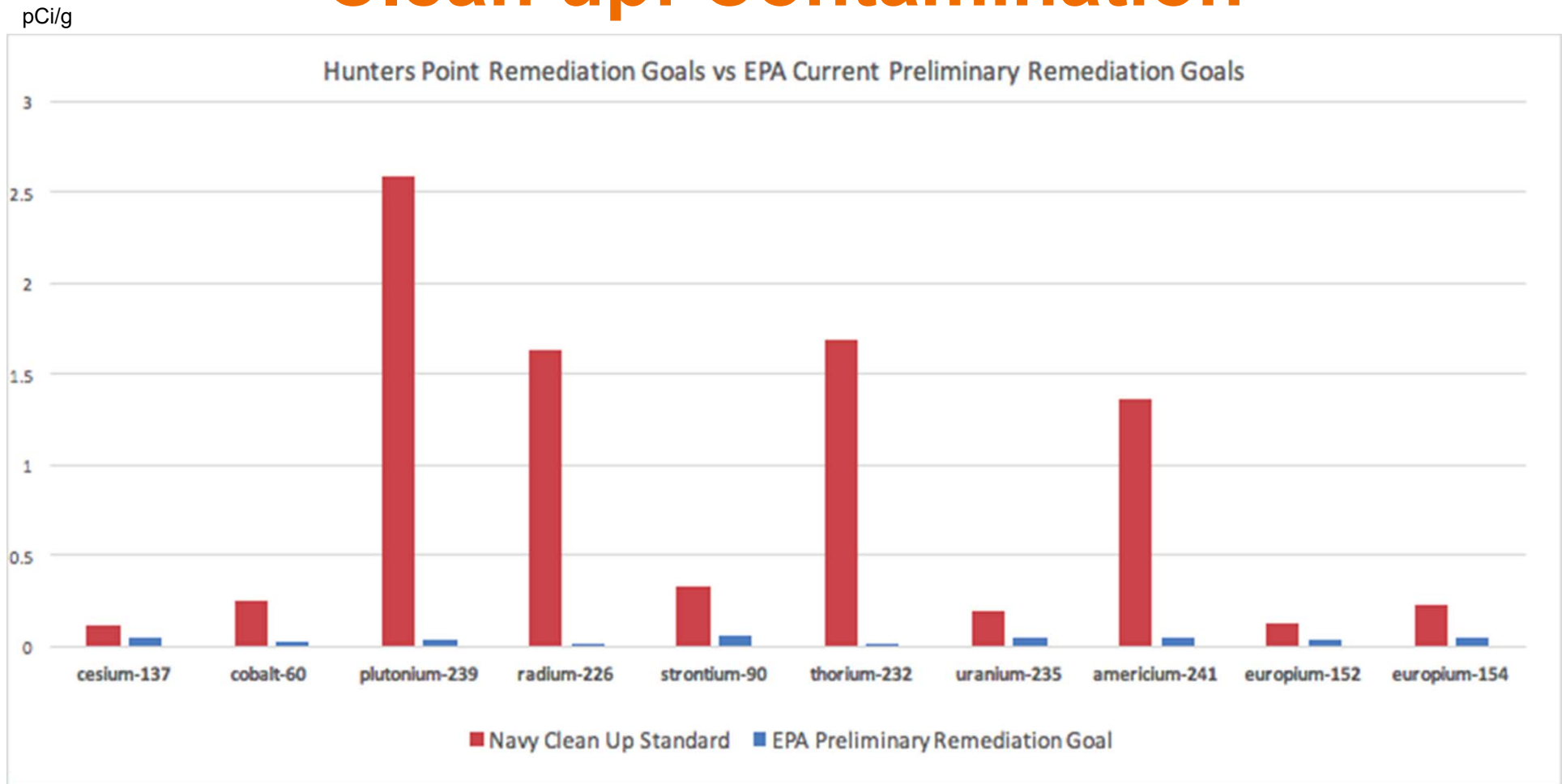
Level I and Level II Waste Disposal Sites



# Comparison of EPA PRGs and Remediation Goals

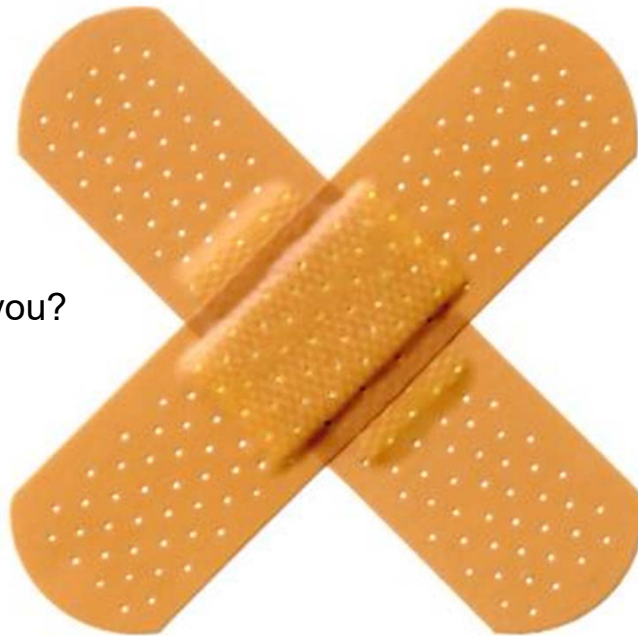
Radionuclide	Hunters Point Remediation Goal (pCi/g)	Current EPA Residential PRG Preliminary Remediation Goal (PRG)	Factor by which HPNS Standards are Relaxed Goals Compared to EPA PRGs
cesium-137	0.113	0.0466	<b>2.4</b>
cobalt-60	0.252	0.0319	<b>7.9</b>
plutonium-239	2.59	0.0357	<b>72.5</b>
radium-226 *	1.633	0.0063	<b>259.2</b>
strontium-90	0.331	0.0639	<b>5.2</b>
thorium-232	1.69	0.00347	<b>487</b>
uranium-235	0.195	0.0475	<b>4.1</b>
americium-241	1.36	0.047	<b>28.9</b>
europium-152	0.13	0.0376	<b>3.5</b>
europium-154	0.23	0.0452	<b>5.1</b>

# Clean up: Contamination



# EPA/Navy Cleanup Plan for Hunters Point

- “Durable Cover Solution”
- Cover Up vs. Clean Up
- What does this mean to you?
- Long Term Problems



Rather than clean up the  
contamination, the Navy is  
relying upon

“Institutional Controls”





# Conclusions

Clean up efforts at Hunters Point Naval Shipyard **are not** consistent with EPA guidelines

Old/Out-of-date Standards that don't comply with current EPA Guidance

Safety Concerns

Disposal of Radioactive Materials in Unlicensed Sites

Clean Up vs. Cover Up

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# Questions

# ?



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**SUPERIOR COURT OF CALIFORNIA**

**COUNTY OF SACRAMENTO**

PHYSICIANS FOR SOCIAL  
RESPONSIBILITY-LOS ANGELES, a  
non-profit corporation; SOUTHERN  
CALIFORNIA FEDERATION OF  
SCIENTISTS, a non-profit corporation;  
COMMITTEE TO BRIDGE THE GAP, a  
non-profit corporation; and CONSUMER  
WATCHDOG, a non-profit corporation

Petitioners,  
v.

DEPARTMENT OF TOXIC  
SUBSTANCES CONTROL;  
DEPARTMENT OF PUBLIC HEALTH;  
and DOES 1 to 100

Respondents,

THE BOEING COMPANY, a corporation;  
DOES 1 to 100

Real Party In Interest.

Case No.: 34-2013-80001589

**PETITIONERS' NOTICE OF MOTION  
AND OPENING MEMORANDUM OF  
POINTS AND AUTHORITIES IN  
SUPPORT OF PETITION FOR WRIT  
OF MANDATE**

(CEQA Matter Under Public Resources  
Code, § 21000 et seq.)

Date: May 4, 2018  
Time: 9:00 a.m.  
Dept.: 28  
Judge: Hon. Richard K. Sueyoshi

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PLEASE TAKE NOTICE that on May 4, 2018, at 9:00 a.m. in Department 28 of the above court, located at 720 9th Street, Sacramento, California, Petitioners Physicians for Social Responsibility – Los Angeles, Southern California Federation of Scientists, Committee to Bridge the Gap, and Consumer Watchdog (“Petitioners”), will move for an order granting a peremptory writ of mandate prohibiting Respondents and Defendants Department of Toxic Substances Control and Department of Public Health from (a) approving, permitting, authorizing or concurring in demolition activity by Real Party in Interest the Boeing Company of the remaining Boeing-owned structures in Area IV of the Santa Susana Field Laboratory in Ventura County, California until Respondents have complied with the California Environmental Quality Act (“CEQA”); (b) relying upon unpromulgated underground regulations as radiological “clean-up standards” for the release from state license and for disposal of debris from demolition; and (c) relying on numeric clean-up standards that were not adopted by regulation or in compliance with CEQA as required by the writ of mandate issued by this Court in 2002 in the case *Committee to Bridge the Gap v. Bonta* (Case No. 01CS01445).

Pursuant to Local Rule 1.06, the Court will make a tentative ruling on the merits of this matter by 2:00 p.m., the court day before the hearing. To receive the tentative ruling, you can access the Court's website at [www.saccourt.ca.gov](http://www.saccourt.ca.gov) or arrange to obtain the tentative ruling from the clerk of Department 28. If you do not call the Court and the opposing party by 4:00 p.m. the court day before the hearing, no hearing will be held.

Respectfully submitted,

**STRUMWASSER & WOOCHELL LLP**  
Michael Strumwasser  
Andrea Sheridan Ordin  
Beverly Grossman Palmer



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CONSUMER WATCHDOG

Harvey Rosenfield

Pamela M. Pressley

By:   
Beverly Grossman Palmer

*Attorneys for Physicians for Social  
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Federation of Scientists, Committee to Bridge the  
Gap, and Consumer Watchdog*

1                                   **OPENING MEMORANDUM OF POINTS AND AUTHORITIES**

2                                   **INTRODUCTION**

3           The management and disposal of radioactively contaminated materials and debris  
4 presents critical environmental and public health concerns. Public agency decisions regarding  
5 these issues should therefore be held to exacting standards for public disclosure, opportunity for  
6 comment, and reasoned analysis in support of the ultimate decision – all values embraced by  
7 both the California Environmental Quality Act (“CEQA”) and the Administrative Procedure  
8 Act (“APA”). Respondents Department of Toxic Substances Control (“DTSC”) and Department  
9 of Public Health (“DPH”) have flouted both of these statutes, permitting Real Party in Interest  
10 The Boeing Company (“Boeing”) to avoid public scrutiny and increased costs of the safe  
11 disposal of its radioactively contaminated waste from former nuclear research and testing  
12 facilities disposed of in licensed low-level radioactive waste facilities, as required.

13           This case involves radioactive and chemical remediation efforts in a 290-acre portion of  
14 the Santa Susana Field Laboratory (“SSFL”) site known as Area IV, a highly contaminated site  
15 used as a nuclear research and testing facility from the mid-1950s into the 1990s, which is now  
16 located within miles of hundreds of thousands of residents. Investigations to support clean-up  
17 of SSFL have been on-going for decades, and have disclosed significant contamination of soil,  
18 groundwater, and bedrock, with chemicals such as trichloroethylene (“TCE”) and dioxins, and  
19 carcinogenic radionuclides such as plutonium-239, cesium-137, and strontium-90. These  
20 radioactive compounds are known to have health effects on humans, including cancers, and if  
21 waste that is contaminated with these substances is not properly disposed of, the potential  
22 environmental and public health effects are significant. If this waste is recycled, these isotopes  
23 may end up in consumer products where radioactivity was never intended. This is a highly  
24 contaminated site that requires extensive remediation to protect the health of those who will use  
25 the site in the future and those who presently reside alongside it.

26           Petitioners Physicians for Social Responsibility, Southern California Federation of  
27 Scientists, Committee to Bridge the Gap, and Consumer Watchdog (“Petitioners”) are nonprofit  
28 organizations that are gravely concerned about SSFL’s remediation, including the decisions

1 about the demolition and disposal of debris from these nuclear structures. DTSC and DPH  
2 (collectively “Respondents”) have approved the demolition and disposal of structures formerly  
3 used for nuclear weapons development and research without even the first step of  
4 environmental review under CEQA. In addition, instead of relying upon duly-promulgated  
5 regulations, Respondents have repeatedly and consistently utilized numeric “clean-up  
6 standards” to determine that radioactive structures and their debris is suitably “clean” to be  
7 released from a license and disposed at facilities not licensed for the disposal of radioactive  
8 waste, ignoring their own specific regulations that govern the termination of licenses. Material  
9 that meets these standards is not “clean”—according to the Environmental Protection Agency’s  
10 calculator, exposure to radiation at these levels could increase cancer risk by thousands over the  
11 EPA’s targets. Moreover, these standards are illegal “underground regulations” that violate the  
12 APA. Reliance upon these numeric standards is also in violation of a writ of mandate issued by  
13 this Court to Respondent DPH in 2002, commanding DPH to comply with CEQA and the APA  
14 prior to promulgating any regulation setting numeric clean-up standards. Rather than comply  
15 with this order, DPH has ignored its duly adopted regulations and relied upon underground  
16 regulations instead of engaging in the rulemaking process.

17 Unifying these three legal violations is Respondents’ fundamental departure from key  
18 principles of California law: open, public, decisionmaking processes. By failing to conduct a  
19 review under CEQA for the demolitions of the structures contaminated with nuclear waste,  
20 Respondents made their decisions behind closed doors, far from the open process required by  
21 CEQA. Likewise, by relying on guidance documents that were not adopted following an APA-  
22 compliant rulemaking, which would require public notice and comment, DPH has shielded from  
23 public scrutiny its decisions about acceptable residual radioactive contamination at SSFL and  
24 other sites throughout the state. The purpose of both CEQA and the APA is to require agencies  
25 to set forth the reasoning behind their decisions to the public. Those objectives have been  
26 roundly defeated by Respondents, who have structured their decisions to avoid such review and  
27 scrutiny. The Petition for Writ of Mandate should be granted and Respondents should be  
28 required to comply with CEQA and the APA.

## STATEMENT OF FACTS

This case has its roots in the Cold War era, when the U.S. government made and tested rockets, nuclear reactors, and various nuclear applications at the SSFL. (See *Boeing Co. v. Movassaghi* (9th Cir. 2014) 768 F.3d 832, 834.) SSFL was chosen as the site for this dangerous research because it was remote at that time, but today, more than a half million people live within 10 miles of the site. (*Ibid.*) Residential neighborhoods exist within a mile of the site. (DTSC001192.<sup>1</sup>) Nearby communities include Simi Valley, Chatsworth, Canoga Park, Moorpark, Bell Canyon, Thousand Oaks, Agoura Hills, and Calabasas. Other neighbors of the SSFL site include the Santa Monica Mountains National Recreation Area, two state parks, and a 3,000 acre Jewish education center and camp. (*Natural Resources Defense Council v. U.S. Department of Energy* (N.D. Cal. 2007) included as Exhibit 82.) Nuclear weapons and reactor activities took place in a 290-acre area of the site known as Area IV. (*Ibid.*) At its peak, Area IV was the site of ten nuclear reactors, seven criticality test facilities, the “Hot Laboratory,” the “Nuclear Materials Development Facility” (a plutonium fuel fabrication facility), and various test and nuclear material storage areas. (*Ibid.*) This lawsuit specifically concerns the demolition and disposal of the following six structures formerly used for nuclear research, all of which were extant as of the spring of 2013: Building 4005, a uranium carbide manufacturing facility; Building 4009; Building 4011 (low bay); Building 4055; Building 4093, also called L-85, a research reactor; Building 4100, Fast Critical Experiment Laboratory/Advanced Epithermal Thorium Reactor. (DTSC007647.)

The decades of operations at SSFL led to vast environmental contamination. The U.S. Court of Appeals for the Ninth Circuit deemed it “a terrible environmental mess,” that “unarguably imposed tremendous harm to the environment. The soil, ground water, and bedrock were seriously contaminated.” (*Boeing Co. v. Movassaghi, supra*, 768 F.3d at p.835.)

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<sup>1</sup> Citations to the certified administrative record for DTSC are prefaced by “DTSC;” citations to the certified administrative record for DPH are prefaced by “DPH;” and citations to the stipulated set of exhibits for the second and third causes of action refer to “Exhibit.”

1 “In 1959, one of the reactors experienced a partial meltdown that released radioactive gases into  
2 the atmosphere for three weeks,” leading to extensive contamination throughout the site. (*Ibid.*)

3 Other contamination resulted from:

4 nuclear reactor accidents, an open burn pit for sodium-coated materials, and  
5 numerous fires and accidents at the ‘Hot Lab.’ The ‘Hot Lab’ was used for  
6 cutting up spent nuclear fuel from the site’s reactors and spent fuel shipped to the  
7 lab from elsewhere in the United States. Radioactive material was also dumped at  
various locations around the site. One disposal procedure consisted of shooting  
barrels of toxic substances with shotguns to make them explode and burn. (*Ibid.*)

8 The radioactive isotopes detected on site include plutonium-239, cesium-137, and strontium-90,  
9 all highly carcinogenic. (DTSC005893.) The U.S. Environmental Protection Agency’s  
10 (“EPA’s”) 2012 soil study in Area IV revealed extensive radiological contamination: of the  
11 3,750 samples taken, 500 were found to have radioactivity above background, many in the area  
12 around various Area IV structures. (DTSC005892.)

13 Respondent DTSC is the state’s lead regulatory agency responsible for ensuring  
14 compliance with California’s Hazardous Waste Control Law. (DTSC Answer, § 11.) DTSC  
15 has been overseeing remedial efforts at the site since at least 1992, when it issued an  
16 enforcement order under Health and Safety Code section 25187. (DTSC00001-4.) In 2007,  
17 DTSC issued a Consent Order for Corrective Action to the site’s current owner Boeing, to the  
18 U.S. Department of Energy (“DOE”) and to the National Aeronautics and Space Administrative  
19 (“NASA”) covering the entire site, identifying numerous structures in Area IV as Solid Waste  
20 Management Units or Areas of Concern that required further investigation and the development  
21 of remedial approaches. (DTSC001228, DTSC001239-1243.)

22 In 2010, DTSC entered into an Administrative Order on Consent for Remedial Action  
23 (“2010 AOC”) with the DOE, specifically pertaining to Area IV and an adjacent portion of  
24 SSFL. (DTSC002101-21411.) The 2010 AOC applies to both chemical and radiological  
25 contamination (DTSC002103), and requires the remediation of soils to local background levels  
26 (DTSC002104). As defined in the 2010 AOC, “[s]oils shall mean saturated and unsaturated  
27 soil, sediment, and weathered bedrock, **debris, structures, and other anthropogenic**  
28 **materials.**” (DTSC002105 (emphasis added).) The AOC requires that soils with radioactive

1 contamination above background be disposed at a licensed low-level radioactive waste (LLRW)  
2 facility. (DTSC2141e.)

3 The 2010 AOC includes DTSC's oversight of demolition of structures in Area IV and  
4 requires the appropriate disposal of the resultant debris. The AOC covers all contamination in  
5 Area IV, irrespective of ownership of the contaminated material. (DTSC002101.) The AOC  
6 expressly applies to and is binding upon not just DOE but also its contractors, and Boeing has  
7 testified that Boeing's remedial activities at the site are *only* undertaken in its capacity as a  
8 contractor to DOE. (DTSC002139; Exh., 80 p. 3, ¶¶ 38-39.) Moreover, the radioactive  
9 contamination at the site is, they claim, due to DOE activity; neither the state nor Boeing  
10 disputes that the radioactive contamination at the site is either a result of federal activity or is  
11 indistinguishable from federal contamination. (*Boeing v. Movassaghi, supra*, 768 F.3d at p.  
12 835.) Indeed, Boeing has attested that by contract DOE has "taken responsibility for all  
13 radiological contamination in Area IV." (Exh. 80, p. 3, ¶ 39.)

14 Respondent DPH is the state agency that regulates radioactive materials in California  
15 through the issuance of radioactive material licenses. (DPH Answer, § 12.) DPH has issued  
16 such a license for the SSFL. (DPH00001.) Historically, DPH's licenses for SSFL have  
17 permitted the use and possession of large quantities of a range of radioactive isotopes. (Exhs.  
18 10 & 11.) The license applies to the entire site and remains in effect, although some structures  
19 have been "released for unrestricted use," and others have been demolished under DPH  
20 oversight. (DPH0002 [conditions 13(b) & (j) include DPH approval of disposal and  
21 demolition].) DPH is also responsible for overseeing the disposal of low level radioactive  
22 waste. (See Cal. Code Regs., tit. 17, § 30470.)

23 This litigation concerns DTSC and DPH's approval of Boeing's demolition activities in  
24 Area IV and the disposal of the resultant debris. As will be set forth in detail, since 2008 DTSC  
25 has required Boeing to seek its approval prior to *any* demolition at SSFL. (DTSC001287-88.)  
26 As part of its oversight, DTSC ordered Boeing to draft Standard Operating Procedures ("SOP")  
27 for DTSC's approval that would govern the demolition activities at the SSFL site.  
28 (DTSC001520.) At that time, DTSC solicited public comment on Boeing's SOP, stating that

1 the proposed SOP was “not applicable to building demolitions at SSFL in areas where  
2 radiological contamination elements are documented or suspected (such as Area IV).”  
3 (DTSC001784.)

4 In spite of this public assurance, and *without any public notice*, in November 2012  
5 Boeing and DTSC agreed to amend the SOP to include procedures for demolition and disposal  
6 of what Boeing termed “non-radiological buildings in Area IV,” including “pre-demolition  
7 radiation screening.” (DTSC005898.) These supposedly non-radiological structures were  
8 demolished and their debris disposed in 2012 and early 2013. (DTSC007809.) A detailed  
9 review and analysis of the radiation surveys Boeing submitted to Respondents reveals that even  
10 these non-radiological structures contained detectable quantities of radioactive contamination.  
11 (Exh. 79, pp. 39-42.) In spite of these measurements, DTSC and DPH permitted Boeing to send  
12 these materials to municipal landfills and into the recycling stream. (DTSC007570.)

13 DTSC requested that Boeing prepare an additional SOP amendment in April 2013 that  
14 included procedures for the demolition of at least six admittedly *radiological* buildings in Area  
15 IV. (DTSC007824-7851.) In conducting initial reviews of the structures, a DPH employee  
16 observed that based on their history, all structures has potential issues with residual radioactivity  
17 in demolition debris, including the possibility of activated concrete or radioactive materials in  
18 drainage structures. (DPH004852-4855.) DTSC and DPH reviewed and approved the  
19 demolition and off-site disposal of debris from one such structure (the L-85 remnant slab) on  
20 May 1, 2013 (DTSC007921), requiring Boeing to conduct additional radiological screening on  
21 the debris prior to approving its off-site disposal on July 22, 2013 (DTSC009227). DTSC relied  
22 upon analysis by DPH and DTSC employees that compared the radiation levels in this structure  
23 and the debris to numeric standards set forth in a federal guidance document known as Reg.  
24 Guide 1.86, which was based on “typical portable instrument detection limits in 1974,” and  
25 which has since been repealed by the Nuclear Regulatory Commission (“NRC”).  
26 (DTSC008054; DTSC008080; DPH004880; Exh. 57.)

27 Petitioners notified DTSC and DPH of their serious concerns about the environmental  
28 consequences of demolition and off-site disposal on August 5, 2013, and filed this lawsuit the

next day to prevent any further demolition activity. By the time this litigation was filed, Boeing had submitted requests for approval of the demolition of four additional structures, but DTSC and DPH had not yet issued final reviews of those requests. (DTSC002426 [Building 4011]; Building 4055 [DTSC007132]; DTSC008020 [Building 4055, the plutonium fuel fabrication facility]; DTSC008751 [Building 4009].) Boeing requested that DPH remove Building 4100 from its license in order to permit its demolition, and DPH did so on July 6, 2013. (DPH004886; Exh. 9.)

Petitioners’ Motion for Preliminary Injunction came before this Court, the Honorable Alan Sumner presiding, on October 25, 2013. The Court granted Petitioners’ Motion on December 11, 2013, ruling that Petitioners showed a likelihood of success on their claim that Respondent DTSC failed to comply with CEQA, because of DTSC’s actions requiring Boeing to prepare the SOPs and its exercise of “detailed and continuing oversight of Boeing’s activities.” (December 11, 2013, Order After Hearing Granting, In Part, Motion for Preliminary Injunction, p. 7.) The Court found that DTSC had both “approved Boeing’s demolition and disposal activities,” and “undertaken an activity that could [a]ffect the environment” by approving the SOPs. (*Id.*, p. 10.) The Court concluded that Petitioners did not demonstrate a likelihood of prevailing on their underground regulation claim, because the use of another’s agency’s guidance document in Boeing’s SOPs did not constitute a rule of general application. (*Id.*, p. 15.) Subsequently, this Court, the Honorable Alan Sumner presiding, denied Boeing’s Motion for Summary Judgment. Now before this Court is the decision whether to issue a writ of mandate to order Respondents to comply with CEQA for the demolition activity and to comply with the APA by ending their reliance upon illegal underground regulations.

## ARGUMENT

**I. RESPONDENTS HAVE NOT COMPLIED WITH CEQA IN THEIR REVIEW AND APPROVAL OF DEMOLITION AND DISPOSAL OF STRUCTURES WHERE SIGNIFICANT QUANTITIES OF RADIATION WERE UTILIZED AND RELEASED TO THE ENVIRONMENT**

This case is a simple one: no agency took even the first step in the CEQA process. In a post-hoc reconstruction, Respondents disclaim their authority to take the very actions they took



1 for years, reviewing and approving the demolition proposals and imposing conditions on the  
2 performance of that activity. The record is replete with evidence that Respondents and Boeing  
3 alike recognized that the agencies had authority over Boeing’s demolition activity, even  
4 questioning whether these activities triggered CEQA obligations, yet failed to follow the open,  
5 public, CEQA process.

6 **A. CEQA’s Comprehensive Environmental Review Scheme Applies to**  
7 **Discretionary Projects that Are Carried Out or Approved by State Agencies**

8 “CEQA is a comprehensive scheme designed to provide long-term protection to the  
9 environment. In enacting CEQA, the Legislature declared its intention that all public agencies  
10 responsible for regulating activities affecting the environment give prime consideration to  
11 preventing environmental damage when carrying out their duties.” (*Mountain Lion Foundation*  
12 *v. Fish & Game Com.* (1997) 16 Cal.4th 105, 112 [citing Pub. Resources Code, § 21001].) The  
13 Supreme Court has instructed that CEQA is interpreted “to afford the fullest possible protection  
14 to the environment within the reasonable scope of the statutory language.” (*Friends of*  
15 *Mammoth v. Board of Supervisors* (1972) 8 Cal.3d 247, 259.)

16 CEQA requires environmental review and analysis *prior* to the approval of discretionary  
17 projects by state agencies. (Pub. Resources Code, § 21080.) A “project” is any activity which  
18 may cause either a direct physical change or a reasonably foreseeable indirect change in the  
19 environment, and which involves the issuance by one or more agencies of a lease, permit,  
20 license, certificate, or other entitlement for use. (Pub. Resources Code, § 21065.) The term  
21 “approval” refers to an agency decision that commits the agency to a definite course of action in  
22 regard to a project. (Cal. Code Regs., tit. 14, § 15352(a).) Projects with both discretionary and  
23 ministerial elements must be treated as discretionary. (Cal. Code Regs., tit. 14, § 15268(d).)

24 DTSC and DPH have failed even to take the first step in CEQA review. (*Davidon Homes*  
25 *v. City of San Jose* (1997) 54 Cal.App.4th 106, 112.) When an agency first considers an action,  
26 it must determine whether it is a “project” under CEQA. The term “project” encompasses “the  
27 whole of an action which has a potential for resulting in physical change in the environment,  
28 directly or ultimately, and includes the activity which is being approved and which may be

1 subject to several discretionary approvals by governmental agencies.” (*Burbank–Glendale–*  
2 *Pasadena Airport Authority v. Hensler* (1991) 233 Cal.App.3d 577, 592 (“BGPAA”).) “A claim  
3 that an agency approved a project with potentially significant environmental effects before  
4 preparing and considering an EIR is an issue concerning procedural error that is to be decided  
5 by the courts independently.” (*Parchester Village Neighborhood Council v. City of Richmond*  
6 (2010) 182 Cal.App.4th 305, 310.)

7 “‘Project’ is a term of art.” (*Banning Ranch Conservancy v. City of Newport Beach*  
8 (2012) 211 Cal.App.4th 1209, 1220.) “[W]hen a court determines whether an activity is a  
9 project, the statute is ‘to be interpreted in such a manner as to afford the fullest possible  
10 protection to the environment within the reasonable scope of the statutory language.’” (*Friends*  
11 *of Sierra R.R. v. Tuolumne Park & Recreation Dist.* (2007) 147 Cal.App.4th 643, 653 (quoting  
12 *Friends of Mammoth, supra*, 8 Cal.3d at p. 259).) In light of this long-standing interpretive  
13 principle, courts routinely define the term “project” broadly, and have included in the scope of  
14 the definition many activities that do not involve the issuance of a “permit” as encompassed  
15 within the “other entitlement for use” aspect of Public Resources Code section 21065, subd. (c).  
16 (See, e.g., *Bozung v. Local Area Formation Comm.* (1975) 13 Cal.3d 263, 278-279 [annexation  
17 determination falls within “other entitlement for use,” in spite of fact that actual use of property  
18 is subject to future determination of city]; *Riverwatch v. Olivenhain Mun. Water Dist.* (2009)  
19 170 Cal.App.4th 1186, 1202-1204 [concluding that water district agreement to truck water to  
20 landfill is part of construction and operation of landfill for purposes of CEQA project]; *County*  
21 *of Amador v. City of Plymouth* (2007) 149 Cal.App.4th 1089, 1099-1100 [gaming development  
22 that could proceed without local approval does not preclude analysis under CEQA of project in  
23 which local government must construct public services to support casino]; *McQueen v. Board of*  
24 *Directors* (1988) 202 Cal.App.3d 1136, 1143-1144 [under CEQA, scope of project extends  
25 beyond agency acquisition of contaminated site to include remediation of site].) “[W]hen the  
26 agency’s activity involves a regulation (as compared to building a physical structure, such as a  
27 road or power plant), the whole of the activity constituting the ‘project’ includes the enactment,  
28

1 implementation and enforcement of the regulation.” (*POET, LLC v. State Air Resources Board*  
2 (2017) 12 Cal.App.5th 52, 57.)

3 Only discretionary projects, as opposed to ministerial ones, are subject to CEQA. A  
4 project is discretionary if it “requires the exercise of judgment or deliberation when the public  
5 agency or body decides to approve or disapprove a particular activity.” (*Mountain Lion Found.*,  
6 *supra*, 16 Cal.4th at pp. 117-118.) Courts apply a functional test to determine if an activity  
7 involves the exercise of discretion, assessing whether “the approval process involved allows the  
8 government to shape the project in any way which would respond to any of the concerns which  
9 might be identified in an environmental impact report.” (*Friends of Westwood, Inc. v. City of*  
10 *Los Angeles* (1987) 191 Cal.App.3d 259, 270.) “[W]here the agency possesses enough  
11 authority (that is, discretion) to deny *or modify* the proposed project on the basis of  
12 environmental consequences the EIR might conceivably uncover, the permit process is  
13 ‘discretionary’ within the meaning of CEQA.” (*Id.* at p. 272 (emphasis in original).) The courts  
14 may review whether an agency has approved a ministerial or discretionary project by examining  
15 whether the agency has exercised discretionary authority through the imposition of conditions.  
16 (*Day v. City of Glendale* (1975) 51 Cal.App.3d 817, 822-823.)

17 Finally, “[a] group of interrelated actions may not be chopped into bite-size pieces to  
18 avoid CEQA review.” (*Association for a Cleaner Environment v. Yosemite Community College*  
19 *District* (2004) 116 Cal.App.4th 629, 638.)

20 “CEQA mandates that environmental considerations do not become  
21 submerged by chopping a large project into many little ones, each with a  
22 potential impact on the environment, which cumulatively may have disastrous  
23 consequences. . . . A narrow view of a project could result in the fallacy of  
division, that is, overlooking its cumulative impact by separately focusing on  
isolated parts of the whole.” (*BGPAA, supra*, 233 Cal.App.3d at p. 592.)

24 **B. DTSC’s Approval of the Procedures Governing Demolition of Radiologic**  
25 **Structures and Approval and Active Oversight Over the Demolition Itself**  
26 **Constitute a Project Under CEQA**

27 DTSC asserted control and authority over Boeing’s Area IV demolition activities, as this  
28 Court recognized in granting its preliminary injunction. The full certified administrative record  
provides no reason to conclude otherwise: it is replete with evidence that DTSC on many

occasions required Boeing to submit procedures and proposals for its review, to await its approval, and to abide by conditions it imposed on those approvals.

From the get-go, DTSC has included SSFL structures and the contamination they may contain as encompassed within the environmental remediation orders it issued. (See DTSC000308 [referencing demolition of structures and treatment as hazardous waste]; DTSC001267-1271 [DTSC memorandum describing how existing structures could be source of release of hazardous materials to environment]; DTSC000836 [Area IV Hot Lab included as solid waste management unit]; DTSC001239-1243 [identifying numerous Area IV buildings as waste management units or areas of concern for investigation]; DTSC001313-1314 [DTSC requires building sampling even if no known use of hazardous materials in building]; DTSC002106-2107 [2010 AOC includes demolition of structures].) DTSC has consistently acknowledged that SSFL's buildings are potential sources of environmental contamination. (DTSC001267-1271; DTSC001272-1281; DTSC001306-1307; DTSC001312-1316.)

Indeed, as soon as DTSC learned that Boeing had demolished a structure outside of Area IV, DTSC immediately informed Boeing that it would require advance notice for all demolitions and pre- and post-demolition sampling. (DTSC001287-1293; DTSC001456 [DTSC complaining that it "never provided approval" for demolition in 2008].) In 2009, when Boeing first proposed demolition activity that was near, but not in, Area IV, DTSC applied the regulatory brakes:

"DTSC staff have expressed concern about the presence of contamination that might have migrated from Area IV into Area III. I thought we agreed Boeing would put together a special demolition plan to address how to identify any potential radioactive or chemical contamination in this area that could potentially impact demolition materials such [sic] the foundation building materials, underground utilities, etc. that are slated for offsite disposal and/or recycling." (DTSC001515; see also DTSC001525 [staff discussing same proposed demolition, stating "We do not want to approve the demolition unless we can confidently determine the building materials are free from rad and chemicals and/or managed appropriately."].)

Internal communications among DTSC staff explained that the agency "must be satisfied with the level of detail [in the documentation provided by Boeing] before we can approve demolition," insisting on "a defensible *internal* review procedure prior to allowing any structure

removals.” (DTSC001638-1639 [emphasis added].) Staff also listed potential concerns about demolition activity, including “potentially allowing poorly characterized soils to be transported offsite” and “potentially generating contaminated building or road debris that will be taken offsite in an uncontrolled manner.” (DTSC001638.)

Consistent with DTSC’s recognition that the SSFL structures are potential sources of both chemical and radiological contamination, in 2009, DTSC informed Boeing that it had “concerns regarding proposed and ongoing demolition activity” at SSFL, because “[a]s the agency responsible for ensuring that all [Resource Conservation and Recovery Act (“RCRA”)] corrective action and response action requirements are met, it is essential that DTSC be advised of any potential demolition activities that may require DTSC oversight and/or approval.” (DTSC001520.) DTSC therefore “require[d]” Boeing to prepare Standard Operating Procedures, which DTSC staff reviewed and required Boeing to modify. (*Ibid*; DTSC001661; DTSC001663-1664; DTSC001716-1722.) DTSC explained the purpose of the SOPs was to assure that building demolition would not result in the removal and uncontrolled reuse of potentially contaminated debris, and to ensure that “review, approval, documentation and the administrative record of proposed building demolition at a minimum meet federal RCRA and state HWCL regulatory requirements.” (DTSC001716; see also DTSC001661 [internal communication stating that purpose of SOPs is to ensure that demolition “does not by-pass DTSC’s approval obligation, CEQA assessment and notification to the community.”].) DTSC staff recognized the relationship between the past use of these structures and the potential for environmental contamination: “DTSC regulates release of hazardous waste and hazardous waste constituents into the environment. Most of the buildings in Area I and III intended for demolition have been utilized in site operations where hazardous materials or chemicals were used or managed and have resulted in operations where chemicals were likely spilled or released.” (DTSC002042 [DTSC comments on draft SOP in track changes].)

DTSC solicited public comment on these SOPs, telling the public that it had “required the Boeing Company to submit the SOP document to make sure an evaluation of each structure proposed for demolition occurs. The SOP requires an assessment of each structure for possible

chemical and radiologic contamination.” (DTSC1783.) In answer to the question “Will DTSC Oversee the Demolition Work,” DTSC explained that it would review each building to “determine whether issues are present that require more thorough review . . . DTSC may also choose to observe any of the demolitions at random to ensure compliance with the SOP.” (DTSC001784.) The public was also informed that “the SOP is not applicable to building demolitions at SSFL in areas where known radiological contaminant releases are documented or suspected (such as Area IV).” (DTSC001784; see also DTSC001927; DTSC002041.)

DTSC staff reviewed and revised the SOPs, adding requirements designed to protect various environmental resources, including protection of endangered species and preservation of historic and cultural resources. (DTSC002082.) DTSC required screening for radiation, even in areas where radiation was not historically used. (DTSC001663.)

Boeing first raised the issue of demolishing structures in Area IV in June 2012 (DTSC002738), telling DTSC that its radiological structures would not be further surveyed prior to demolition (DTSC002739). In short order, DTSC told Boeing to stop all work in preparation for demolishing any structures in Area IV. (DTSC002924 [“Until we reach conclusions on demolition -related Area IV radiological characterization, DTSC cannot concur with pre demolition activities by Boeing in Area IV that involve the removal or disturbance of any site features,”]; see also DTSC002943 [requesting that demolition and pre-demolition be delayed until DTSC completes Area IV review]; DTSC002952 [“DTSC agrees that special radiological considerations exist for the demolition and removal of Area IV buildings and debris. We have notified Boeing that we cannot concur with the commencement of Building 4015 demolition by their requested start date of July 16, 2012, and they have agreed to delay demolition activities.”].) Several months later, DTSC informed Boeing that it could commence “pre-demolition activities” only at certain supposedly non-radiological facilities in Area IV. (DTSC002969-2970.) Even for those pre-demolition activities, however, DTSC required Boeing to provide radiation screening results before any material was sent off-site for disposal. (DTSC002970.)

1 DTSC first approved the demolition of a non-radiological structure in October 2012,  
2 permitting Boeing to demolish the remaining slab of Building 4015, while requiring additional  
3 radiological screening of inaccessible portions of the structure. (DTSC005805-06.) Shortly  
4 thereafter, Boeing submitted to DTSC an amendment to the SOP to address the demolition of  
5 non-radiological structures in Area IV (DTSC005897-99), and subsequently submitted requests  
6 to demolish a number of additional Area IV non-radiological structures (DTSC005900;  
7 DTSC005912; DTSC005824; DTSC006329). DTSC reviewed and approved these requests,  
8 imposing requirements that Boeing conduct additional radiological screening of certain  
9 materials and provide those results to DTSC. (See, e.g., DTSC005805-5808; DTSC005900-  
10 5902; DTSC006281-6286; DTSC006312-6319; DTSC007597-7603; DSTC007629.) Boeing  
11 did not take any action in furtherance of demolition without first awaiting DTSC's approval.  
12 (DTSC005799; DTSC006540; DTSC003131 [listing DTSC activity supervising demolition].  
13 As DTSC described the relationship between Boeing and DTSC in a letter informing Boeing  
14 that it was out of compliance with the SOP: "Boeing has performed demolition and removal of  
15 its non-radiological buildings at SSFL's Area IV since October 2012, under the terms of an  
16 amendment February 2010 [SOP] document which closely involves DTSC in the review,  
17 comment, and field oversight process for building demolition." (DTSC007604.)

18 After nearly completing demolition for the non-radiological structures, Boeing moved on  
19 to the six structures at issue in this litigation, the former radiological facilities in Area IV. In  
20 December 2012, Boeing noted that it was waiting for an "ok to proceed" with pre-demolition in  
21 the Area IV former radiological buildings, and according to Boeing, was told by DTSC that it  
22 was "looking to have DPH agree with an 'ok to begin demolition,'" for these structures.  
23 (DSTC006540; see also DTSC006684 [DTSC instructs Boeing not to begin pre-demolition  
24 work so it can consult with DPH]; DTSC006686 [DTSC concern with pre-demolition is  
25 removal of materials for off-site disposal] DPH004817 [Boeing "waiting for concurrence" for  
26 pre-demolition].) In DTSC's January 2013 status update, it noted that Boeing began "pre-  
27 demolition" work in Area IV radiological facilities "with DTSC concurrence," and that DTSC  
28

1 will “provide field oversight” as Boeing completed its Area IV non-radiological demolition and  
2 its other pre-demolition work. (DTSC006658 & 6663.)

3 Boeing submitted its first demolition proposal for an Area IV radiological structure in  
4 February 2013. (DTSC006804; DTSC007039 [DTSC staff noting that proposal is first former  
5 radiological site “under our oversight program with Boeing”].) Boeing submitted its SOP  
6 Amendment 2 to address the former radiological facilities in March 2013. (DST007593-96.)  
7 DTSC reviewed and commented (DSTC007615, DTSC007639-43) and Boeing accepted those  
8 comments in April 2013 (DTSC007645-50). No public review or comment was solicited on  
9 these SOP amendments. These SOP amendments clearly state that the SOPs were “approved”  
10 by DTSC in the first instance, and that the amendment was prepared at DTSC’s specific request.  
11 (DTSC007647.) This SOP amendment requires the involvement of both DTSC and DPH in  
12 reviewing demolition requests, and commits to sending all demolition waste to a Class I  
13 hazardous waste landfill, and only to dispose of materials “exceeding federal and state release  
14 criteria” as low-level radioactive waste. (DTSC007648-49.)

15 Pursuant to the SOP amendments for radiological facilities, Boeing’s request to demolish  
16 the L-85 was reviewed by both DTSC and DPH, who both required Boeing to conduct an  
17 additional radiological survey of the debris prior to off-site disposal. (DTSC007921-34.)  
18 Boeing performed this survey and the results were reviewed by DTSC, DPH, and the U.S. EPA.  
19 (DTSC08076-81; DTSC0828-29; DTSC0854-55.) DTSC staff also began their reviews of other  
20 radiological structures, noting the presence of nearby soil samples with elevated levels of  
21 radiation (DTSC008062; DTSC008069), as well as subgrade features that could contain  
22 radionuclide contamination (DTSC007810-7811). This Court issued a preliminary injunction  
23 before those review and approval documents were finalized.

24 DTSC acknowledges that the remediation of the SSFL site in general is subject to  
25 review under CEQA. The 2007 Consent Order and 2010 AOC both call for preparation of an an  
26 Environmental Impact Report. (DTSC001206; DTSC002118; see also DTSC008546.) DTSC  
27 has argued that it lacks authority over Boeing’s buildings, but it admits that “it is charged with  
28 overseeing and authorizing demolition activities of equipment and structures used for



1 management [of] hazardous waste, and that its mandate sometimes includes overseeing  
2 demolition activities in areas where releases of hazardous waste or materials occurred.” (DTSC  
3 Answer, § 11.) DTSC also admits that “it oversees the demolition and disposal of some but not  
4 all of the buildings at the SSFL site.” (*Ibid.*) The agency cannot now, after having asserted its  
5 authority over this activity for years, credibly erase that narrative, denying its acknowledged  
6 authority over the former radiological facilities whose demolition has the greatest potential for  
7 environmental harm.

8 In 2008, under “Section 4.4.2 of the Consent Order for Corrective Action,” Boeing  
9 submitted to DTSC, for its review and approval, a set of procedures to evaluate “environmental  
10 conditions at all existing buildings, concrete pads, and supporting infrastructure.”  
11 (DTSC001299-1300.) DTSC requested that Boeing include procedures to “obtain the necessary  
12 information for the RFI reports which are needed to draft cleanup alternatives analysis and the  
13 EIR.” (DTSC001309.) DTSC reviewed these procedures, acknowledging that these structures  
14 “will undergo demolition as part of the site-wide decommissioning and demolition program.”  
15 (DTSC001325.) DTSC also directed Boeing to investigate environmental conditions in Area IV  
16 structures. (DTSC001353.) DTSC’s policy staff explained that buildings located in  
17 contaminated areas of SSFL were subject to “enhanced DTSC oversight.” (DTSC002074.)  
18 DTSC staff even debated whether excavation in connection with demolition would “be in  
19 compliance with the CEQA process?” (DTSC001328.)

20 And even if the “project” were conceived of simply as DTSC’s review and approval of the  
21 demolition and disposal of Boeing-owned buildings in Area IV, it is still an endeavor with the  
22 “potential for resulting in physical change in the environment,” (*BGPAA, supra*, 233  
23 Cal.App.3d at p. 592) because radioactive materials could easily be released into the  
24 environment as a result of the demolition and disposal, something DTSC explicitly  
25 acknowledged in exercising special oversight of the demolition of the Area IV structures. (See  
26 DTSC001525; DTSC002042; DTSC002924; DTSC002952; DTSC002970; DTSC005805-5806;  
27 DTSC007615; DTSC007639-7643.) The Area IV radiologic demolition is either a “project” on  
28 its own, requiring CEQA review, or it is a part of the overall site remediation project for which

1 the agency has acknowledged that an EIR is required: either way, CEQA review is required  
2 *before* action.

3 **C. DPH is a Responsible Agency Due to Its Authority Over SSFL as Licensor**

4 CEQA requires that all public agencies that are responsible for aspects of approvals of  
5 projects to consider the environmental impacts of their approvals. While a so-called “lead  
6 agency,” must be designated to prepare the appropriate environmental documents (Pub.  
7 Resources Code, § 21067), each “responsible agency,”—every public agency other than the lead  
8 agency that is also responsible for approving discretionary aspects of a project—must, upon  
9 approval of a project, also make the same findings as a lead agency relevant to the subjects  
10 within the agency’s jurisdiction. (*Id.*, §§ 21069; 21081.6.) As the Court of Appeal has  
11 explained, “If an agency’s approval is required for any activity ‘integral to the project’ and the  
12 agency could, in its discretion, deny approval, then that agency is a responsible agency under  
13 CEQA. Although “the lead agency is responsible for considering all environmental impacts of  
14 the project before approving it, a responsible agency has a more specific charge: to consider  
15 only those aspects of a project that are subject to the responsible agency’s jurisdiction.”  
16 (*Riverwatch*, *supra*, 170 Cal.App.4th at 1205-1206 (quoting 1 Kostka & Zischke, Practice  
17 Under the Cal. Environmental Quality Act, (Cont.Ed.Bar. 2d ed.2008) § 3.18, p. 122.)) “A  
18 ‘responsible agency’ is *not* limited to those public agencies that approve, or issue a permit for,  
19 an *entire* project . . . but also includes those agencies that carry out or approve *part* of a  
20 proposed project subject to CEQA.” (*Riverwatch*, *supra*, 170 Cal.App.4th 1186 at p. 1206.)

21 As DPH admits, it is the state agency that regulates the use of radioactive materials in  
22 California through the issuance of radioactive materials licenses. (DPH Answer, ¶ 12.) DPH  
23 also is responsible for regulating the disposal of radioactive waste (Health & Safety Code,  
24 § 114715) and monitoring radioactive materials in the environmental to protect public health  
25 (*id.*, § 114755). DPH issued a radioactive materials license to SSFL. (DPH00001-DPH001166.)  
26 RPI Boeing’s demolition SOP amendment acknowledges that it must comply with this license  
27 in connection with the demolition project: “Boeing will continue to comply with the  
28 requirements of the California Radioactive Material License 0015-19 (current and future

1 amendments) when acquiring, using, storing or disposing of Boeing-owned radioactive  
2 materials in, or from, Boeing-owned facilities.” (DTSC005899.) Historically, Boeing has  
3 sought DPH approval prior to demolishing the structures in which it used radiologic materials  
4 and disposing the debris offsite. (E.g., Exh. 2, pp. 5-6, 73, Exh. 3, pp. 5, 11, 153.)

5 DPH was made aware in August 2012 by both Boeing and DTSC that the facilities in  
6 Area IV were planned for imminent demolition. (See DPH004516; DPH004632.) Shortly  
7 thereafter, in November 2012, Boeing requested “release of building 4100 for unrestricted use,  
8 and removal of the buildings from radioactive materials license 0015-16 as an authorized place  
9 of use.” (DPH004668.) Although this request was not explicitly tied to the demolition  
10 program, subsequent communications were unequivocal that the release from license was a  
11 necessary approval to permit Boeing to demolish Building 4100. (E.g., DPH004817 [December  
12 2012 agenda for DPH-DTSC phone conference noting future demolition proposals and license  
13 issues for Building 100].) Boeing made this linkage very clear to DPH, explaining that DTSC  
14 had “given the go-ahead to begin pre-demo work on several Boeing-owned former released  
15 radiological facilities in Area IV, including building 4100 which is still awaiting your release.”  
16 (DPH004823.) Boeing asked that DPH complete its release from license in order to facilitate its  
17 submission of a demolition notification package for Building 4100 on Boeing’s desired  
18 schedule. (*Ibid.*) DPH internally told employees to complete their reviews “so that we won’t be  
19 impeding its demolition process schedule.” (DPH004825; see also DPH 005413.) DPH  
20 ultimately approved Amendment 112 releasing Building 4100 from Radioactive Materials  
21 License 0015-19 on July 9, 2013. (Exh. 9; see also DPH004786-4813 & DPH005825-5911].)

22 DPH approved the license amendment that released Building 4100 in full knowledge  
23 that DTSC and Boeing intended for the structure to be demolished. In so doing, DPH conferred  
24 a discretionary approval to Boeing, with knowledge that the approval was a necessary step in a  
25 larger demolition project. DPH was therefore obliged under CEQA to review the  
26 documentation of the environmental impacts of the project and to make findings that  
27 appropriate mitigation had been required. Of course, DPH did not and could not have done so,  
28 because no such documentation was prepared.

1 DPH's other recent activity at SSFL is largely defined in its contract with DTSC, from  
2 which DPH carefully excised any phrasing that sounded remotely like it was authorizing Boeing  
3 to take any specific action, clearly still smarting from prior controversies regarding disposal of  
4 demolished structures at the site. ([DPH004616 [after Boeing contacts DPH regarding its  
5 involvement in reviewing demolition proposals, high-level DPH official complains, "Is  
6 [Radiological Health Branch] really going to get sucked back into this witches brew?"];  
7 DPH004660 [noting controversy over past DPH approvals of disposal outside of sites licensed  
8 for rad waste]; DPH006188 [DTSC informing DPH that it would like it to recommend disposal  
9 options] DPH006153 ["Is RHB in the business approving disposal options and disposal  
10 locations?"; DPH006195-6200 & DPH006210-6215 [DPH editing contract language to strike  
11 out role overseeing disposal].) DPH was quite clearly relieved that DTSC was in charge of the  
12 site clean-up. DPH acknowledges, however, that it continues to have role at SSFL entirely apart  
13 from DTSC, in its licensing capacity, and that these duties require DPH's involvement in  
14 decommissioning the site. (DPH005414) Should this Court determine that it is not DTSC who  
15 exercised its authority over these demolitions, DPH, as the licensor of the site, would have  
16 oversight authority over this structure and the disposition of its debris, as it has exercised in  
17 prior demolitions at the site. (Exhs. 2, 3, 8.) DPH's determinations to concur in the demolition  
18 and the release of the debris from the demolition would be approvals with the possibility for an  
19 effect on the environment, thus squarely presenting the duty to comply with CEQA. It cannot  
20 be that neither DPH nor DTSC have any obligation to consider the environmental consequences  
21 of the demolition, and the disposal of debris from a DPH-licensed facility that is being  
22 remediated under cleanup orders from DTSC. CEQA applies to this activity and environmental  
23 review must be conducted by the appropriate lead agency.

24 **II. FOR DECADES THE RESPONDENTS HAVE FAILED TO COMPLY WITH**  
25 **THE CALIFORNIA ADMINISTRATIVE PROCEDURES ACT WHEN**  
26 **REVIEWING AND AUTHORIZING DEMOLITION AND DISPOSAL**  
**ACTIVITIES RELATED TO RADIOLOGICAL STRUCTURES.**

27 Under the rulemaking provisions of the Administrative Procedure Act ("APA," Gov.  
28 Code, § 11340 et seq.), executive branch rules of general applicability must be adopted by

1 formal rulemaking, with public notice, opportunity for comment, and full transparency.

2 “The APA establishes the procedures by which state agencies may adopt  
3 regulations...One purpose of the APA is to ensure that those persons or entities  
4 whom a regulation will affect have a voice in its creation...as well as notice of the  
5 law’s requirements so that they can conform their conduct accordingly....  
6 Moreover, public participation in the regulatory process directs the attention of  
7 agency Policy makers to the public they serve, thus providing some security  
8 against bureaucratic tyranny....” (*Tidewater Marine Western, Inc. v. Bradshaw*,  
9 *supra*, 14 Cal. 4th 557, 568-569 (internal citations omitted)).

10 Rules that are implemented without following this procedure are termed “underground  
11 regulations” and are prohibited and invalid.

12 “No state agency shall issue utilize, enforce, or attempt to enforce any guideline,  
13 criterion, bulletin, manual, instruction, order, standard of general application, or  
14 other rule . . . unless [it]has been adopted as a regulation and filed with Secretary  
15 of State pursuant to this chapter.” (Gov. Code, § 11340.5, subd. (a).)

16 A “regulation” is defined by the APA to include any rule, order, or standard of general  
17 application adopted by a state agency to implement, interpret, or make specific the law it  
18 enforces or administers, or to govern its procedure. (Gov. Code § 11342.600; *Tidewater, supra*,  
19 14 Cal.4th at p. 571.) If a rule or standard constitutes a “regulation” and there is no express  
20 statutory exemption excusing the agency from the strict procedural requirements of the APA  
21 then it is an invalid underground regulation, and cannot be enforced. (*Tidewater, supra*, 14  
22 Cal.4th at p. 571; *Bollay v. Office of Administrative Law (2011)* 193 Cal.App.4th 103, 106.)

23 Under *Tidewater*, a “regulation” subject to the APA has two principal characteristics:  
24 (1) it has general application and (2) it is intended to implement or interpret the source of law  
25 enforced by the agency. To be subject to the rulemaking requirement of the APA, a rule “need  
26 not . . . apply universally; a rule applies generally so long as it declares how a certain class of  
27 cases will be decided.” (*Tidewater, supra* 14 Cal 4th at p. 571).

#### 28 **A. Respondents Relying on “Release Standards” Never Adopted as Lawful Rules of General Application**

In explicit contravention of the APA, DTSC and DPH have fashioned a body of  
underground law—a skein of health and safety standards adopted in secret entirely outside the

1 APA-prescribed process—and applied that underground law to their regulation of SSFL.

2 Countless reports, memoranda, letters, and e-mails demonstrate that during the past 15  
3 years, DTSC and DPH have relied upon these underground rules to define acceptable levels of  
4 radiation in order to authorize the demolition and disposal of radiologically contaminated  
5 structures across California, including at SSFL. Specifically Respondents have repeatedly  
6 relied on the following “release standards,” none of which were adopted as the APA prescribes:

- 7 1. DPH’s Radiologic Health Branch “Guidelines for Decontamination of Facilities and  
8 Equipment Prior to Release for Unrestricted Use” (“DECON-1”) (Exh. 65)
- 9 2. The 1991 “policy memorandum” from DPH named IPM-88-2 (Exh. 63)
- 10 3. Regulatory Guide 1.86 (“Reg. Guide 1.86”), adopted in 1974 by former U.S. Atomic  
11 Energy Commission (now NRC) (DPH001176-1185) and
- 12 4. DOE’s Guidance 5400.5 (RJN, Exhs. 4, 8, 10) (DPH002149).

13 It was wrong for DPH and DTSC to continually rely upon these standards, which on their face,  
14 are clearly “guidelines, criteria and standards of general application” that DTSC and DPH knew  
15 had not been promulgated through notice and comment rulemaking, as is required by the APA.

16 **B. Respondents Are Applying the ‘Release Standards’ as Rules of General**  
17 **Application.**

18 In years of approving Boeing’s demolition and waste disposal plans, DTSC and DPH  
19 improperly relied upon these unsanctioned documents. None of these regulatory standards have  
20 been adopted formally by DPH or DTSC. Indeed, none of the underground standards have been  
21 adopted, formally or informally, as a guide to the offsite *disposal* of radiologically contaminated  
22 debris. The APA prohibits reliance on such regulatory documents without full compliance with  
23 the rulemaking provisions. (*Armistead v. State Personnel Bd.* (1978) 22 Cal.3d 198, 203-205).

24 Nevertheless, these general standards have become engrained in licensing and related  
25 enforcement actions of DPH over the years, relying on the DECON-1 and IPM-88-2 policy  
26 statements in DPH’s licensing and enforcement.

27 To be subject to the rulemaking requirement of the APA, a rule “need not. . . apply  
28 universally; a rule applies generally so long as it declares how a certain class of cases will be

1 decided.” (*Tidewater, supra*, 14 Cal 4th at p. 571). Here, DPH and DTSC have jointly applied  
2 the radiological release standards to a clear and definable class of cases: the demolition of  
3 radiologically contaminated structures, and disposal of the resulting waste. Every demolition  
4 approval issued thus far for buildings at SSFL has been evaluated under these criteria.

5 Many DPH, DTSC and Boeing documents demonstrate that the approving agencies and  
6 the regulated party have all recognized that the underground “release standards” have been  
7 central to the course of their negotiations and the agencies’ eventual approval of any demolition  
8 and disposal of waste from the SSFL site. The documents in the administrative record and other  
9 public records describe in mountainous detail a consistent program of enforcement and  
10 licensure by DTSC and DPH relying upon Reg. Guide 1.86, DECON-1, IPM 88-2 and DOE  
11 5400.5, examples of which are listed below.

#### 12 **DPH Radioactive Material License Amendments (1999-2013)**

13 Petitioners have reviewed nine SSFL license amendments (Exhibits 1-9), beginning with  
14 License No. 0015-19, Amendment 103, which specifically references and relies on the release  
15 limits measured by 5400.5, DECON-1 (Exh. 1, pp. 6, 29, 152), and ending with Radioactive  
16 Material License 0015-19 Amendment 112, which similarly references and relies on the release  
17 limits of Reg. Guide 1.86, DECON-1 as well IPM 88-2 (Exh. 9, pp. 193, 214, 236).<sup>2</sup> Each of  
18 the ten license amendments reference and rely upon one or more of the same four underground  
19 standards. (Exh. 2, p. 25; Exh. 3, pp. 89, 151, 153; Exh. 4, p. 22; Exh. 5, pp. 3, 19; Exh. 6, pp.  
20 50, 55; Exh. 7, pp. 20; Exh. 8, pp. 20.)  
21  
22  
23

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24 <sup>2</sup> To walk through Exhibit 9, which releases various rooms of Building 4100 for unrestricted  
25 use, the Final Status Survey detailing results of the investigation of surface contamination  
26 begins on page 179. At page 193, the reader is directed to Appendix A for the “surface activity  
27 limits” upon which “the decision for unrestricted release” “will be based.” At page 236,  
28 Appendix A presents the limits, with footnotes identifying their source as Reg. Guide 1.86,  
IPM-88-2, and DECON-1. Other SSFL license amendments are similar in their structure and  
recite satisfaction of the surface activity limits as a basis for release for unrestricted use.

1 **DTSC Memoranda**

2 In a May 1, 2013, letter from DTSC explains its review of planned removal of concrete  
3 and asphalt at former L-85 Area to Boeing. This five page letter attaches survey results,  
4 comments and recommendations. As with countless other DTSC documents, the DTSC  
5 explains its recommendation to release for unrestricted use: “All surface activity measurements  
6 met the general surface activity limits for release/**clearance** of equipment and material for  
7 unrestricted use from former radiologic facilities and were below US NRC Regulatory Guide  
8 1.86, USDOE Order 5400.5 and CDPH guidance DECON-1 and IPM-88-2 action levels.  
9 Survey results support these conclusions.” (DTSC007928; see also DTSC009227 [letter from  
10 DTSC to Boeing post-demolition of former L-85 Area]). The clear language of the agency  
11 shows reliance on underground regulations are of general application.

12 **“Release Criteria for Boeing Radiological Buildings in Area IV”**

13 At the suggestion of DTSC and DPH, Boeing offered to facilitate and expedite DPH’s  
14 and DTSC’s review by identifying sections in the voluminous survey report where release  
15 criteria were specified. By email of February 15, 2013 (DPH005118), to DTSC and DPH,  
16 Boeing forwarded Table 1, which set forth release criteria for Buildings Number 4011, 4055,  
17 and 4100, as Reg. Guide 1.86 (DPH005122). As this table and the subsequent excerpts from  
18 those release reports make abundantly clear (DPH5123-5167), the release criteria determining  
19 that these nuclear facilities were suitable for unrestricted use were the general application  
20 underground regulations here.

21 In addition to the consistent reliance upon these standards at SSFL, DPH relied upon the  
22 general standards throughout California, when DPH was faced with similar licensing and  
23 enforcement situations. Below are examples that Petitioners have identified from documents  
24 obtained from DPH:

25 **General Atomics** holds a radioactive material license from DPH as well. Many of its  
26 facilities have been released from restricted use. Routinely, requests to release facilities from  
27 the license at these facilities contain a table titled “State of California Acceptable Surface  
28 Release Standards,” which cites as its source the guidance document DECON-1, and all of the



1 requests reference the same numeric state criteria for release for unrestricted use. (See Exh. 31,  
2 pp. 2, 16, 29, 30, 155; Exh. 32, pp. 32, 41; Exh. 33, pp. 10-11, 21, 74, 84; Exh. 34, p. 75; Exh.  
3 35, p. 4, 19; Exh. 36, p. 16; Exh. 37, p. 71, 108, 209; Exh. 38, pp. 16, 26; Exh. 39, p. 17, 28;  
4 Exh. 40, p. 20, 79; Exh. 41, p. 21, Exh. 42, p. 24, 56, 66; Exh. 43, p. 10, 123; Exh. 44, p. 11, 23;  
5 Exh. 45, p. 24.) These license amendments contain no suggestion that DPH ever deviated from  
6 its position that the DECON-1 (equivalent to Reg. Guide 1.86) standards are “acceptable” levels  
7 of surface contamination permitting a release from license.<sup>3</sup>

8       At **University of California, Berkeley**, DPH has approved at least 8 license  
9 amendments since 2007 that involve the release of facilities from the institution’s radioactive  
10 material license. These include at least four instances where DPH was informed that the  
11 structures to be released from the license would be demolished after the release from license.  
12 (Exhs. 21, 26, 27, 28.) In all of these license amendments, the agency relied upon analysis  
13 demonstrating compliance with the limits of Reg. Guide 1.86. (Exh. 21, p. 11; Exh 22, pp. 17,  
14 33; Exh. 23, pp.12, 28; Exh. 24, pp. 20, 61; Exh. 25, pp. 12, 22; Exh. 26, pp. 7, 15, 39; Exh. 27,  
15 p. 20; Exh. 28, pp. 7, 49, 51.)

16       **Stanford University** also holds a DPH-issued radioactive materials license. In 2008  
17 and 2013, DPH approved licensed amendments that expressly relied upon Reg. Guide 1.86 as a  
18 clearance standard. (Exhs. 29 & 30.) In one 2013 amendment, the licensee noted that “due to  
19 the current situation in California, where there is not an established dose-based release criteria,  
20 [thresholds for surface contamination called DCGLs] were selected using Reg. Guide 1.86 as  
21 the release criterion.” (Exh. 30, p. 27.) In that case, DPH expressly inquired of the university  
22 whether its release criteria satisfied the standards of Reg. Guide 1.86 for removable  
23 contamination (dust). (*Id.*, p. 51.)  
24

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25  
26       <sup>3</sup> Indeed, at a March 2003 joint meeting of DPH, NRC, and General Atomics employees,  
27 as described in minutes drafted by a General Atomics employee, the state’s implementation of  
28 its regulatory requirement to “make a reasonable effort to eliminate residual radioactive  
contamination,” is “[b]asically taken from the NRC Regulatory Guide 1.86.” (Exh. 46, p. 3.)

1 Both DTSC and DPH have relied upon these standards in the remediation of the  
2 **Hunters Point Naval Station** in San Francisco, where DTSC is the state agency overseeing the  
3 remediation of a radiologically-contaminated former naval facility. DTSC approved a 2006  
4 “Action Memorandum” that established as remediation goals the standards of Reg. Guide 1.86  
5 to address the former buildings, which the memorandum makes clear are a source of potential  
6 contamination to the environment because they are contaminated with low levels of radioactive  
7 waste. (Exh. 47, pp. 24-24, 29.) In reliance on data showing compliance with the Reg. Guide  
8 1.86 standards, the Navy obtained DTSC and DPH’s concurrence in the release for unrestricted  
9 use of numerous buildings throughout the site. (Exh. 48, p. 70-71, 783, 875, 951; Exh. 49  
10 [DTSC and DPH concurring in release]; Exh. 50 [DPH concurring in release for unrestricted  
11 use]; Exh. 51, p. 119, 308-310; Exh. 52, p. 14; Exh. 54, pp. 318, 638, 752-754.)

12 **C. Respondents Regularly Relied Upon the Invalid Release Standards in the**  
13 **Course of Implementing and Interpreting the Laws They Enforced.**

14 The second prong of the Tidewater test for unlawful underground regulations is that it is  
15 intended to implement or interpret the source of law enforced by the agency. DTSC is using  
16 them to implement its oversight of remediation of sites contaminated with radiation, and DPH is  
17 using them to implement its licensing and enforcement authority over California licensees. In  
18 the course of their administration of these laws, Respondents resort to numerical standards for  
19 acceptable and unacceptable levels of radiation—standards they consistently use but have never  
20 adopted in compliance with the APA.

21 In fact, agency staff were well aware of their violation of the APA and this Court’s 2002  
22 Order. In a long string of e-mails from July 19 through July 26, 2006, a senior DPH staff  
23 member expressed the dilemma well:

24 “We are being put in a very troublesome position by DTSC in their request that  
25 we approve the Boeing work plan and then defend that position at the August 31  
26 public meeting, because (of)... the up to 15 mrem per year work plan criteria for  
27 disposing of any radioactive material found in the burn pit to a hazardous waste  
28 landfill in California, ....It’s true in the past we have approved (or at least  
concurred with the same, or similar, criteria, but I believe these were all before  
the court order that prohibited CDHS from establishing a numerical

decommissioning criteria without going through the CEQA process.” (Exh. 81, p. 2.)

It is undeniable that from that date in 2006 to 2013, when this lawsuit was filed, DPH and DTSC did not resolve the conflict about standards for decommissioning, and continued to use the invalid numeric standards in its license oversight and enforcement. (See, DPH 005 119 (Radiological survey plan for the remaining DOE-owned building in Area IV utilizing release criteria based on RG 1.86), and DPH 00 6150 (Recommendation L-85 Bldg. utilizing RG 1.86).)

Repeatedly, whenever DTSC reviewed Boeing’s request to demolish structures in Area IV and dispose of the debris, in its oversight of SSFL’s remediation, the agency simply reviewed Boeing’s surveys against each of the four documents. (See, e.g., DTSC005810; DTSC005905; DTSC006286; DTSC006318-6319; DTSC007047-7048; DTSC007603; DTSC009231; DTSC009234.) These conclusions are core bases for DTSC’s determination to permit the demolition and disposal of the radiological debris.

### **III. RESPONDENT DPH IS IN VIOLATION OF THE 2002 WRIT OF MANDATE ISSUED BY THIS COURT**

Since 2002, DPH has been under the order of this Court that it cannot adopt any numeric clean-up standards for radioactive materials without first complying with CEQA and the APA. (*Committee to Bridge the Gap v. Bonta* (Case No. 01CS01445)). DPH admits that it attempted to adopt as its own a federal regulation for clean-up standards, while also conceding that “in 2002, the Honorable Gail Ohanesian overturned the regulation, ruling that [DPH] failed to comply with CEQA and the APA, and issued a writ of mandate prohibiting [DPH] from readopting the radiological criteria for license termination set forth [in the federal regulations] or any similar provisions relating to the establishment of clean-up standards for license termination without first preparing an EIR.” (DPH Answer, ¶¶ 31 & 32.) Moreover, also in 2002, in response to this Court’s striking down DPH’s regulations, Governor Davis **ordered** DPH to adopt regulations, and to consider the public health and environmental consequences associated with disposal in so doing. (DPH004526.) Yet DPH has continued to apply

1 underground numeric standards for decommissioning without CEQA or APA compliance, in  
2 spite of its staff's realization that these actions are not in compliance.

3       The 2002 judgment of this Court followed a 2000 DPH adoption as its own regulation of  
4 a federal regulation establishing a 25 millirem dose-based standard for license termination,  
5 without conducting CEQA review, on the basis that the regulation was environmentally  
6 protective, and also without disclosing that the state had authority to adopt a more stringent  
7 standard. (See generally Exhs. 71 & 72.) In 2002, this Court invalidated that regulation,  
8 holding that the dose standard was not a more stringent standard than the approach employed  
9 prior to the regulation, so it was not necessarily protective of the environment, and that the  
10 failure to disclose the possibility of adopting a more stringent standard violated the APA.  
11 (*Ibid.*) This Court issued a writ of mandate ordering DPH “not to readopt the radiological  
12 criteria [in the federal regulation] **or any similar provisions relating to the establishment of**  
13 **clean-up standards for license termination**” without first complying with CEQA. (Exhs. 73  
14 & 74 (emphasis added).) In its return to the writ, DPH informed the Court that under its reading  
15 of the law, “contaminated sites may be decommissioned for unrestricted use if residual radiation  
16 doses are reduced to as low as reasonably achievable . . . but in no event above 25 millirems. . . .  
17 In the absence of legislation or regulations establishing a new standard, [DPH] will continue to  
18 apply this current standard in approving requests to decommission licensed facilities.” (Exh.  
19 75, p. 2; see also Exh. 56.) The petitioners objected to the Return, pointing out that DPH had  
20 informed the court that it would continue to utilize the very same standard that had been  
21 invalidated, essentially transforming it to an underground regulation. (Exh. 76, pp. 4-5.) Over  
22 DPH's objections (Exh. 77), the Court found that DPH was “attempting to avoid the clear  
23 meaning of this Court's ruling,” by returning to the 25 millirem standard (Exh. 78).

24       Around the same time that this Court was invalidating DPH's regulation, Governor Gray  
25 Davis adopted a moratorium barring the disposal of waste from decommissioned sites at  
26 municipal landfills or in the recycling stream. (DPH004525-4526.) This moratorium was  
27 intended to be temporary to fill in a legal gap that had resulted from the invalidation of the  
28 regulations. (DPH004525 “[T]here are currently no California regulations governing the

1 disposal of ‘decommissioned materials’ which are materials with low residual levels of  
2 radioactivity that, upon decommissioning of a licensed site, may presently be released with no  
3 restrictions upon their use”].) Governor Davis explained that in response to this Court’s writ,  
4 DPH would “promulgate regulations only after conducting [CEQA review], including  
5 assessment of the public health and environmental safety risks and the threat to California’s  
6 ground and drinking water associated with disposal of decommissioned materials.” (*Ibid.*) The  
7 Executive Order specifically required DPH to act: “It is **ordered** that [DPH] **shall adopt**  
8 **regulations** establishing dose standards for the decommissioning of radioactive materials by its  
9 licensees. . . . It is further ordered that in adopting such regulations, the Department shall assess  
10 the public health and environmental safety risks associated with the disposal of decommissioned  
11 materials.” (DPH004526 [emphasis added].)

12 DPH has internally recognized that it cannot use standards like Reg. Guide 1.86 without  
13 conducting a rulemaking and review under CEQA, pursuant to this Court’s writ. (Exh. 64 [in  
14 2013, repealing policy that relied upon DECON-1 “due to court order (Case No. 01CS01445);  
15 Exh. 58 [October 2002 email questioning whether use of Reg Guide 1.86 is appropriate after  
16 court order]; Exh. 59 [noting that as a result of 2002 writ, DPH cannot clean up large complex  
17 sites until compliance with CEQA while proposing use of Reg. Guide 1.86 for some purposes];  
18 Exh. 18 [release criteria for decommissioned demolished structure uncertain due to Superior  
19 Court ruling in 2002].) As admitted in early 2003 by one DPH staff person in response to a  
20 question whether DPH should continue to concur in building releases for DOE-facilities that  
21 would be demolished, after the 2002 order, DPH would “need to review against ‘reasonable  
22 effort to eliminate residual material,’” reflecting the language of the duly-adopted regulation.  
23 (Exh. 20, p. 1; Cal. Code Regs., tit. 17, § 30256 (k).) She acknowledged that such review  
24 would require a “full policy on what this means, and procedures to implement the reviews.”  
25 (Exh. 20, p. 1.) Similarly, Boeing acknowledged in 2006 that DPH’s use of any “a priori  
26 chosen dose limit,” would violate the 2002 order, yet at the same time, proposed allowing  
27 materials with surface contamination above background but below Reg. Guide 1.86 levels to be  
28 disposed in a Class I landfill. (Exh. 13.) DPH internally admitted that it was “embarrassing”

1 that Boeing's license contained a 15 mrem site-wide release criteria, because it had issued a  
2 license amendment reaffirming that standard after the issuance of the Court order. (Exh. 19.)  
3 While DPH said in 2003 that it did not think it could approve procedures tied to that site wide  
4 standard, it continued to do so and to retain that license condition for at least 10 more years.  
5 (See DPH000003 [condition 13(o) contains site wide release limit of 15 mrem]; Exh. 12, p. 2;  
6 Exh. 9, p. 214.)

7 Similarly, in 2013, DPH rescinded policy RML-00-02, "Radiological Release Criteria for  
8 Facilities Undergoing Large Scale Decommissioning," which describes the agency's policy for  
9 surface contamination as equivalent to Reg. Guide 1.86 and DECON-1. (Exh. 64, p. 3.) The  
10 rescission form states that "[d]ue to court order, the content on which this policy relies is moot.  
11 Further, other policies cited by this policy have been suspended." (Exh. 64, p.1.) Yet it  
12 continues to release sites based upon the policies in RML-00-02 such as DECON-1 and IPM-  
13 88-2. (Exh. 9, p. 214.)

14 A court that issues a writ of mandate retains jurisdiction to enforce its dictates. (*City of*  
15 *Carmel-by-the-Sea v. Board of Supervisors* (1983) 137 Cal.App.3d 964, 971; *Professional*  
16 *Engineers in Calif. Gov't v. Calif. State Personnel Bd.* (1980) 114 Cal.App.3d 101, 110 [court  
17 has continuing jurisdiction to enforce writ and "any inadequacy in the measures taken to correct  
18 the problem may be dealt with in subsequent orders of the court."].) As set forth at length in  
19 section II, DPH continues to employ the unpromulgated numeric clean-up policies of the NRC,  
20 DOE, its own "a priori" numeric criteria, and license conditions that were specifically premised  
21 on such criteria. It must be concluded that DPH will persist in this practice unless this Court  
22 makes clear that it cannot continue to shirk its regulatory responsibilities.

23 **IV. RESPONDENTS' RELIANCE UPON UNDERGROUND REGULATIONS HAS**  
24 **RESULTED IN THE DISPOSAL OF RADIOACTIVELY CONTAMINATED**  
25 **MATERIALS AT FACILITIES THAT ARE NOT LICENSED FOR LOW**  
26 **LEVEL RADIOACTIVE WASTE, WITHOUT ANY ENVIRONMENTAL**  
27 **REVIEW UNDER CEQA**

28 To be clear, Petitioners' entitlement to the writ of mandate in no way requires  
demonstration of harm. However, the Court should understand a critical reason why

1 Respondents' reliance on the "underground regulations," and concomitant failure to comply  
2 with the 2002 Order, is so troubling. After the "release for unrestricted use" of these structures  
3 and debris that remain contaminated with radiation, those materials get disposed at facilities that  
4 are not licensed for the disposal of low level radioactive waste. At SSFL, Respondents have  
5 released structures for unrestricted use, even if those structures contain radioactivity in excess of  
6 background, so long as the radioactivity does not exceed their underground "standards." After a  
7 structure is released, Respondents take the position that there is no further regulation of "the  
8 residual materials," other than Governor Davis's executive order prohibiting the disposal of  
9 decommissioned materials in municipal (Class III) landfills. (DPH004834; DPH004523-4524;  
10 see also Exh. 12, p. 2.)

11 The fact that a structure has been released because it supposedly satisfied the  
12 underground "surface activity limits," for release for unrestricted use does not mean that the  
13 structure is free from radiation. After an extensive analysis of the disposition of debris from the  
14 supposedly non-radiological facilities in Area IV based upon Boeing's reports and data,  
15 Petitioner Committee to Bridge the Gap determined that Boeing's own surveys of these  
16 structures showed numerous measurements of radiation above background levels. (Exh. 79, pp.  
17 39-43.) None of this material was disposed as low level radioactive waste.

18 The debris from the demolished L-85 building which has already been disposed is as  
19 troubling. The post demolition surveys of that debris contain readings that are not only above  
20 background, but, in several readings, even above the Reg. Guide 1.86 limits themselves.  
21 (DPH006411 [sample 4 and 6 contain "net activity" (which excludes background) beta counts  
22 of over 1000 disintegrations per minute where "surface activity" limit is 1000 disintegrations  
23 per minute; DPH006410 [sample 4 exceeds background and minimum detectable activity;  
24 DPH006350 [sample 49 exceeds background and minimum detectable activity].) Yet  
25 Respondents both concurred in the off-site disposal of *all* this debris to a facility that was not  
26 licensed for the disposal of radioactive waste. (DTSC009227-9242.)<sup>4</sup> Reliance upon the

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27  
28 <sup>4</sup> See also Exh. 46, pp. 2-3 [minutes of DPH/NRC/General Atomics meeting discussing  
disposal of material that is "above background" but "well below the release criteria" so the

1 “underground regulations” to permit the demolition and disposal has resulted in material with  
2 elevated levels of radioactivity being disposed at a facility that was neither licensed nor  
3 designed to accept it, without environmental review of the consequence of such disposal.

4 California law prohibits the disposal of radioactive materials except at sites specially  
5 licensed and designed for that purpose. Health and Safety Code section 114985, subdivision  
6 (m), defines low-level radioactive as “radioactive waste not classified as high-level radioactive  
7 waste, transuranic waste, spent nuclear fuel, or byproduct material.”<sup>5</sup> No statute establishes a  
8 “floor” beneath which material contaminated with non-naturally occurring radioactive material  
9 becomes anything other than low-level radioactive waste; indeed, in the early 1990s when the  
10 federal Nuclear Regulatory Commission attempted to adopt a “below regulatory concern”  
11 threshold, Congress expressly overturned that policy and stated that it was to have no further  
12 effect. (Exhs. 60 & 61.)

13 The Legislature has codified the requirements for a facility to receive a license to accept  
14 low-level radioactive waste, which include a prohibition on shallow land burial, required use of  
15 multiple engineered barriers capable of isolating the waste for at least 500 years, and a  
16 capability for visual inspection or remote monitoring of the waste to detect leakage. (Health &  
17 Safety Code, § 115261.) Federal regulations (which the state has also adopted by regulation)  
18 prohibit disposal of low level radioactive waste without a license. (10 CFR § 61.3; Cal. Code of  
19 Regs., tit. 17, § 30470.)

20 Respondent DPH has previously interpreted these laws to prohibit the disposal of  
21 materials with low levels of radioactivity in California’s hazardous waste disposal sites. In  
22 1999, the Chief of the Radiologic Health Branch of DPH wrote to Safety-Kleen Services, the  
23 operator of the Buttonwillow hazardous waste landfill, explaining that the disposal of  
24 radioactive materials above naturally occurring levels is regulated in California and that such  
25 materials must be disposed at a site licensed for the disposal of radioactive waste. (Exh. 67.)

26  
27 company could –with state approval – dispose the material at a hazardous waste landfill.]

28 <sup>5</sup> Health and Safety Code section 11522, subdivision (I) adds the word “regulated”  
before “radioactive material,” in its definition of low-level radioactive waste.



1 And in 2011, the RHB Chief informed the U.S. Air Force’s McClellan Air Force Base that it  
2 could not dispose radium contaminated materials at the Buttonwillow facility because that site  
3 did not have a license to dispose radioactive materials. (Exh. 69.)

4 Respondent DTSC has interpreted the laws and policies regarding disposal of low level  
5 radioactive waste similarly to DPH. Indeed, the 2010 AOC that governs the remediation of  
6 Area IV requires the disposal of soils (which include, by definition, structures and  
7 anthropogenic materials) with radioactive contamination above background at a licensed low-  
8 level radioactive waste facility. (DTSC2141e.) Similarly, in August 2012, DTSC informed  
9 Boeing “of the decision of Cal EPA Secretary Rodriguez and DTSC Director Raphael that  
10 materials from Area IV with radiation levels above background cannot be routed for recycle or  
11 for non-rad disposal in California.” (DTSC002958 [emphasis original].) Although this decision  
12 was apparently reached by the highest level officials in the agency, it was not implemented as  
13 described. Instead, the “release standards” of Reg. Guide 1.86 replaced “background,” as the  
14 threshold for waste disposal in a licensed low level radioactive waste facility. (See, e.g.,  
15 DTSC005810; DTSC005905; DTSC006286; DTSC006318-6319; DTSC007047-7048;  
16 DTSC007603; DTSC009231; DTSC009234 [all using Reg. Guide 1.86, not background, as  
17 criteria to determine whether material should be disposed as LLRW].)

18 This issue of the disposal of radioactive materials at the Buttonwillow facility was  
19 extensively adjudicated in a state administrative proceeding in 2002. After 15 days of  
20 evidentiary hearings, an appeal board consisting of seven representatives from the Air  
21 Resources Board, the State Water Resources Control Board, DTSC, the Kern and Tulare County  
22 Boards of Supervisors, and two local governments, found that the Buttonwillow conditional use  
23 permit which allowed the disposal of radioactive materials “raise[d] serious questions regarding  
24 the adequacy of the [Conditional Use Permit (“CUP”)] regarding radioactive waste.” (Exh. 70,  
25 pp. 1-4.) The panel specifically referenced the Buttonwillow facility’s acceptance of  
26 contaminated soil from a burn pit at SSFL as an example of the acceptance of radioactive waste.  
27 (*Id.*, p. 3.) As a result of those proceedings, the CUP for the Buttonwillow facility provides that  
28 “[t]he facility shall not accept Radioactive Waste or Prohibited Materials.” (Exh. 55, p. 3.) The

1 permit defines Radioactive Waste as including “by product material,” which would include the  
2 radiation present at SSFL that has resulted from the fission of source materials in a reactor. (*Id.*,  
3 pp. 4-5.) In spite of these conclusions, DTSC (which regulates the hazardous waste facility) and  
4 DPH (which regulates the disposal of radioactive material) have collectively ignored that  
5 decision and the CUP, allowing SSFL radioactive waste to be disposed at Buttonwillow, with  
6 no CEQA review and on the basis of an underground regulation.

7       These actions have the potential for real consequences. As DPH’s own staff have  
8 pointed out, disposal of low level radioactive materials in a “RCRA Class I disposal site”  
9 requires “dose assessment/impact/risk to the transportation workers, workers at the disposal site  
10 and other potential receptors [which] needs to be performed and submitted for review.” (Exh.  
11 81, p. 2.) As staff explained, in the past DPH determined that the disposal of radioactive  
12 materials at Buttonwillow could have a “potential dose impact to people who may reside on the  
13 disposal site in the future . . . [and] the requirements for LLRW disposal site and RCRA class I  
14 disposal site are different in siting, designs, construction, land ownership and other aspects.”  
15 (*Id.*, pp. 2-3.)

16       Respondents will likely claim that little risk is present from exposure to radiation at the  
17 levels permitted by Reg. Guide 1.86 and its ilk. Indeed, such argument has been advanced by  
18 Boeing and others in the past. (See, e.g., DPH005120; Exh. 14, pp. 10-11.) Of course, not all  
19 agree with Boeing’s assessment. Dr. Bemnet Alemayehu, a Ph.D in radiation health physics, is  
20 a program scientist at the Natural Resources Defense Council (“NRDC”). (Declaration of  
21 Bemnet Alemayehu, ¶¶ 1-2.) After receiving training from the EPA, Dr. Alemayehu utilized  
22 the agency’s Preliminary Remediation Goals (“PRG”) calculators for radionuclides. (*Id.*, ¶¶ 3-  
23 4.) These calculators are used by EPA and other professionals to calculate initial cleanup levels  
24 for radiation in soil, water, and air at Superfund sites. (*Id.*, ¶ 3) Using these calculators, Dr.  
25 Alemayehu compared the surface contamination levels in Reg. Guide 1.86 with the EPA’s  
26 remediation goals, determining that the concentrations permitted by Reg. Guide 1.86 for many  
27 of the radionuclides found at SSFL are thousands, or even tens of thousands, of times greater  
28 than the EPA’s preliminary remediation goals. (*Id.*, ¶ 4; Exhs. B-D.)

1 Dr. Alemayehu also utilized the EPA’s PRG calculators to derive the cancer risk from  
2 exposure to radionuclides found at SSFL in the concentrations permitted by Reg. Guide 1.86,  
3 concluding that the additional cancer risk from such exposure is far higher than EPA’s typical 1  
4 in 1,000,000 risk target. (*Id.* at ¶¶ 5-6, Exhs. F-H.) For some radionuclides, exposure at Reg.  
5 Guide 1.86 levels equates to an additional cancer risk of  $1 \times 10^{-3}$  (1 in 1,000) while others are  
6 even more dire, posing an additional cancer of  $1 \times 10^{-1}$  (1 in 10). (*Id.*, ¶ 6.) Dr. Alemayehu  
7 notes that these risks are posed with the reuse of buildings, and could be even greater if the  
8 materials contaminated at such levels were disposed at sites that are not licensed for low level  
9 radioactive waste or if the materials are recycled. (*Id.*, ¶ 7.)

10 Given the significant dispute over the risk and safety of exposure to low levels of  
11 radiation, Respondents’ failure to engage in the prescribed regulatory process under the APA is  
12 all the more troubling. Without any public debate over the consequences of “releasing for  
13 unrestricted use,” and eventual disposal as hazardous waste, materials with low-level  
14 concentrations of radionuclides above what is found in nature, Respondents have established a  
15 regulatory floor below which the radiation just doesn’t matter anymore. Whether this floor is  
16 justified is a subject for debate—a debate that has yet to be held, and is certainly not, at this  
17 point, for this Court to referee. What this Court must determine is that this public debate *should*  
18 happen, that the public must be allowed to weigh in, and that the government must be required  
19 to articulate its reasoning through an APA- and CEQA- compliant rulemaking proceeding.  
20 These Respondents’ repeated practice of relying upon underground regulations is wrong, has  
21 never been proper, and must end now.

## 22 CONCLUSION

23 CEQA and APA impose procedural requirements on public agencies for a reason: our  
24 Legislature has determined that the people of this state deserve to participate in decisionmaking,  
25 and that the decisions of public agencies be informed by environmental consequences and  
26 reasoned analysis. The decisions concerning the demolition and disposal of radioactive  
27 materials deserve this treatment. The writ should be granted so that Respondents are required to  
28 comply with CEQA and the APA.

1 Date: February 22, 2018

Respectfully submitted,

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3 Michael Strumwasser

4 Andrea Sheridan Ordin

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5 CONSUMER WATCHDOG

6 Harvey Rosenfield

Pamela M. Pressley

7  
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**SUPERIOR COURT OF CALIFORNIA**

**COUNTY OF SACRAMENTO**

PHYSICIANS FOR SOCIAL  
RESPONSIBILITY-LOS ANGELES, a non-  
profit corporation; SOUTHERN CALIFORNIA  
FEDERATION OF SCIENTISTS, a non-profit  
corporation; COMMITTEE TO BRIDGE THE  
GAP, a non-profit corporation; and CONSUMER  
WATCHDOG, a non-profit corporation

Petitioners,

v.

DEPARTMENT OF TOXIC SUBSTANCES  
CONTROL; DEPARTMENT OF PUBLIC  
HEALTH; and DOES 1 to 100

Respondents,

THE BOEING COMPANY, a corporation; ROES  
1 to 100

Real Party In Interest.

Case No.: 34-2013-80001589

**DECLARATION OF DR. BEMNET  
ALEMAYEHU IN SUPPORT OF PETITION  
FOR WRIT OF MANDATE**

Date: May 4, 2018

Time: 9:00 a.m.

Dept: 28

Judge: The Honorable Richard K. Sueyoshi

1 I, Bemnet Alemayehu, declare and state as follows:

2 1. I am a Program Scientist at the Natural Resources Defense Council (NRDC). I have  
3 personal knowledge of the statements herein, and if called upon to do so, could and would testify  
4 competently thereto. My professional background, experience, and publications are detailed in my  
5 curriculum vitae which is attached to this declaration as Exhibit A.

6 2. I have a PhD in Radiation Health Physics from Oregon State University. As a program  
7 scientist at NRDC, I work on projects concerning the environmental monitoring and health effects of  
8 radiation. I published peer-reviewed papers in the fields of radiation detection and environmental  
9 radiation monitoring.

10 3. I attended two trainings by the U.S. Environmental Protection Agency (EPA) on the use  
11 of their Preliminary Remediation Goals (PRG) calculators for radionuclides. PRGs are EPA remediation  
12 goals for different environmental media such as contaminated soil or buildings. The PRG Calculator is  
13 an online-based tool ([https://epa-prgs.ornl.gov/cgi-bin/radionuclides/rprg\\_search](https://epa-prgs.ornl.gov/cgi-bin/radionuclides/rprg_search) and [https://epa-bprg.ornl.gov/cgi-bin/bprg\\_search](https://epa-bprg.ornl.gov/cgi-bin/bprg_search)) that allows EPA to calculate initial cleanup levels for radiation in  
14 buildings, soil, water, and air at Superfund sites.  
15

16 4. I have performed calculations with the U.S. EPA Building Preliminary Remediation Goal  
17 (BPRG) calculator, comparing the surface contamination levels set forth in AEC Regulatory Guide 1.86  
18 (1974) with the U.S. EPA remediation goals for buildings, focusing on radionuclides EPA has found in  
19 soil at the Santa Susana Field Laboratory (SSFL) at levels in excess of background. The comparisons  
20 are found in Exhibits B, C and D hereto. This analysis compares the listed Reg. Guide 1.86 levels for  
21 average and maximum radionuclide contamination for external human exposures from contamination on  
22 building material surfaces, and the limits for removable contamination (or dust) that can be inhaled or  
23 ingested, with the U.S. EPA BPRGs for external exposures and for dust. The results from the U.S. EPA  
24 BPRG calculator runs are found in Exhibits B (compared to Reg. Guide 1.86 average levels), C  
25 (compared to Reg. Guide 1.86 maximum levels), and D (compared to Reg. Guide 1.86 levels for  
26 removable contamination, or dust). Since the Reg. Guide 1.86 values are in units of disintegrations per  
27 minute per 100 square centimeters (dpm/100 cm<sup>2</sup>) and the EPA BPRG calculator employs units of  
28 picocuries per square centimeter (pCi/cm<sup>2</sup>), I converted the values into the same units so the results

could be compared; the conversions are in Exhibit E. The Reg. Guide 1.86 concentrations for many of the radionuclides found at SSFL are hundreds, thousands, and even tens of thousands of times higher than EPA's current preliminary remediation goals for buildings. For example, the Reg. Guide 1.86 concentration for plutonium-239 in dust/removable contamination is 490 times higher (i.e., less protective) than the EPA PRG. The Reg. Guide. 1.86 maximum concentration for cesium-137 for external exposures is 1338 times higher than the EPA PRG. For thorium-234 in dust/removable contamination, the Reg. Guide 1.86 concentration is 87,636 times less protective than the EPA PRG.

5. The U.S. EPA typically uses a target excess cancer risk of  $10^{-6}$  for cleanup goals. These terms equate to a risk target of 1 in 1,000,000. This means that one aims for cleanup levels that would be expected to result in only one additional case of cancer per 1,000,000 exposed persons from the remaining contamination.

6. I have also performed calculations with the EPA BPRG calculator using its "risk output" function to obtain EPA's cancer risk estimate for these radionuclides at the Reg. Guide 1.86 levels. The BPRG calculator runs are found in Exhibits F, G, and H, and the unit conversions are in Exhibit I. For many radionuclides, EPA estimates risks from contamination at the Reg. Guide 1.86 levels for many radionuclides to be  $10^{-3}$  and for some, nearly  $10^{-1}$  (i.e., 1 in 1000 to 1 in 10). . The EPA BPRG calculator's estimates of the cancer risks for the radionuclides at the Reg. Guide 1.86 levels thus show that as many as 1,000 to nearly 100,000 additional cases of cancer might occur among 1,000,000 exposed persons. This cancer risk is 1,000 to 100,000 times higher than the 1 in 1,000,000 cancer risk that is the target goal of EPA's PRGs. For uranium-238, for example, the EPA BPRG calculator estimates the risk at the Reg. Guide 1.86 for dust/removable contamination as  $8.57 \text{ E-}02$ , or  $8.57 \times 10^{-2}$ , meaning that if people were exposed at that level, nearly every tenth person would develop a cancer from the contamination. For lead-214 (Pb-214) in removable contamination, the EPA BPRG calculator gives an estimated risk of  $6.99 \text{ E-}02$ , or about 7 excess cancers per 100 people exposed. These are extraordinary risk figures, far above EPA's risk goal of one in a million and also significantly above even the upper limit of risk that EPA deems acceptable in circumstances where there are special factors that make achieving the one in a million excess risk level not feasible.

7. These risks are associated with reuse of buildings. Should the buildings be demolished with concentrations of radionuclides at the Reg. Guide 1.86 levels, and the building materials recycled or disposed of in other than licensed low-level radioactive waste facilities, the risks could be even higher, e.g. because of the potential for more intimate human contact with recycled contaminated materials and potentially higher ingestion risk due to radioactive particulate material from contaminated debris getting into water supplies, crops, or air.

I declare under penalty of perjury under the laws of the state of California that the foregoing is true and correct, and this declaration was executed on February 20, 2018, at Washington, DC.

*Ben S*

Bemnet Alemayehu



## Exhibit A

## BEMNET ALEMAYEHU (PhD)

1152 15<sup>th</sup> St. NW Washington DC, Phone: (202) 289-6868

E-mail: [balemayehu@nrdc.org](mailto:balemayehu@nrdc.org)

### EDUCATION

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**2009-2013.** Oregon State University, Ph.D., Radiation Health Physics

- *Dissertation Title:* "Real-time FPGA-based Radioxenon Measurement using a Compton-suppressed Well-type Phoswich Detector for Nuclear Explosion Monitoring."

**2004-2006.** Addis Ababa University, Addis Ababa, Ethiopia, M.Sc., Radiation Physics

**2000-2004.** Debub University, Dilla, Ethiopia, B.Ed., Physics (Minor, Mathematics)

### RESEARCH INTERESTS

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Environmental Radiation Monitoring

Health Effects of Radiation

Radionuclide study for the Comprehensive Nuclear-Test-Ban Treaty (CTBT) verification

### PROFESSIONAL EXPERIENCE

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#### **Natural Resources Defense Council**

*Program Scientist (2014-Present):*

Environmental Radiation Monitoring

Health Effects of Radiation

#### **Department of Nuclear Engineering and Radiation Health Physics, Oregon State University**

*Graduate Research Assistant (2009-2013):*

Design, construct, characterize and use beta, gamma, and X-ray spectrometers

Develop FPGA-based digital pulse processing techniques for radiation detection and spectroscopy

MCNP simulation

MATLAB and VHDL programming

Radioxenon study for Comprehensive Nuclear-Test-Ban Treaty (CTBT) verification

#### **Department of Physics, Haramaya University, Ethiopia**

*Lecturer (2006-2009):*

Lecturer for the junior and senior level courses: Electronics; Modern Physics; Quantum Mechanics I and Quantum Physics II

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### PUBLICATIONS

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#### *PEER-REVIEWED PUBLICATIONS:*

**Alemayehu, B.**, Mckinzie, M., Cochran, T. et al., "Citizen-based environmental Radiation Monitoring Network," J Radioanal Nucl Chem (2017) 314: 1095.

**Alemayehu, B.** and A. T. Farsoni, "A well-type phoswich detector and FPGA-based pulse shape discrimination for nuclear explosion monitoring," J Radioanal Nucl Chem (2014) 301: 323.

A. T. Farsoni, **Alemayehu, B.**, A. Alhawsawi, and E. M. Becker, "Real-Time Pulse-Shape Discrimination and Beta-Gamma Coincidence Detection in Field-Programmable Gate Array," Nucl. Instruments Methods Phys. Res. Sect. Accel. Spectrometers Detect. Assoc. Equip., 2013.

E. M. Becker, A. T. Farsoni, A. M. Alhawsawi, and **Alemayehu, B.**, "Small Prototype Gamma Spectrometer Using CsI(Tl) Scintillator Coupled to a Solid-State Photomultiplier," Ieee Trans. Nucl. Sci., vol. 60, no. 2, pp. 968–972, Apr. 2013.

A. T. Farsoni, **Alemayehu, B.**, A. Alhawsawi, and E. M. Becker, "A Phoswich Detector with Compton Suppression Capability for Radioxenon Measurements," Ieee Trans. Nucl. Sci., vol. 60, no. 1, pp. 456–464, Feb. 2013.

A. T. Farsoni, **Alemayehu, B.**, A. Alhawsawi, and E. M. Becker, "A Compton-suppressed phoswich detector for gamma spectroscopy," J. Radioanal. Nucl. Chem., pp. 1–6, 2012.

#### *CONFERENCE PROCEEDINGS AND PRESENTATIONS:*

**Alemayehu, B.** "Citizen-based Environmental Radiation Monitoring Network," 2017 Health Physics Society Mid-Year Meeting, Bethesda, MD. January 22-25, 2017.

Farsoni, A.T.; **Alemayehu, B.**; Alhawsawi A. Becker, E. M. "FPGA Based Pulse Shape Discrimination and Coincidence Energy Measurement for a Phoswich Detector," The IEEE Nuclear Science Symposium, Anaheim, CA. Oct. 29-Nov. 4, 2012.

Farsoni, A.T.; **Alemayehu, B.**; Alhawsawi A.; Becker, E.M.; "Real-Time Pulse Shape Discrimination and Radioxenon Measurement in Field Programmable Gate Array," The 34th Monitoring Research Review, Albuquerque, NM, September 17-20, 2012.

**Alemayehu, B.**; Farsoni, A.T.; Alhawsawi, A.M.; Becker, E.M. "Real-time FPGA Based Radioxenon Measurements using an Actively Shielded Phoswich Detector (ASPD)," IEEE Symposium on Radiation Measurements and Applications, Oakland, CA, May 14-17, 2012.

Alhawsawi, A.M.; Farsoni, A. T.; **Alemayehu, B.**; Becker, E.M. "FPGA Digital Pulse Processing for an Actively Shielded Phoswich Detector (ASPD)," IEEE Symposium on Radiation Measurements and Applications, Oakland, CA, May 14-17, 2012.

Becker, E.M, Farsoni, A.T.; Alhawsawi, A.M.; **Alemayehu, B.** "Small Prototype Gamma Spectrometer Using CsI(Tl) Scintillators Coupled to a Solid-State Photomultiplier," IEEE Symposium on Radiation Measurements and Applications, Oakland, California, May 14-17, 2012.

Farsoni, A.T.; **Alemayehu, B.**; Alhawsawi A. "A Compton-Suppressed Phoswich Detector for Radioxenon Measurements," The IEEE Nuclear Science Symposium, Valencia, Spain. Oct. 22-29, 2011.

Farsoni, A.T.; **Alemayehu, B.**; Alhawsawi A. "Preliminary Measurements with a Compton-Suppressed Phoswich Detector," The 33rd Monitoring Research Review. Tucson, AZ, September 12-15, 2011.

## PROFESSIONAL AFFILIATIONS

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Member, Health Physics Society

Member, American Nuclear Society

## Exhibit B

**Comparison of Goals for Average Surface Contamination for External Exposures in Reg. Guide 1.86 to the USEPA Building Preliminary Remediation Goals (BPRGs) for External Exposures**

<b>Radionuclide</b>	<b>EPA Building Preliminary Remediation Goals [BPRGs] (dpm/100 cm<sup>2</sup>)</b>	<b>RG 1.86 Average (dpm/100 cm<sup>2</sup>)</b>	<b>How Many Times Higher (Less Protective) are the RG 1.86 Average Values than EPA BPRGs?</b>
Ac-227	11.566	100	9
Ac-228	1.328	5000	3766
Am-241	5.883	100	17
Bi-212	2.287	5000	2187
Bi-214	3.219	5000	1553
Co-60	1.274	5000	3924
Cs-137	11.211	5000	446
Eu-152	1.738	5000	2876
Eu-154	2.056	5000	2432
Pb-212	2.129	5000	2349
Pb-214	2.708	5000	1846
Pu-238	2.686	100	37
Pu-239	7.171	100	14
Pu-240	1.328	100	75
Ra-226	2.686	100	37
Sr-90	3085800	1000	0.0003
Th-228	2.129	100	47
Th-230	2.686	100	37
Th-232	1.328	1000	753
Th-234	2.664	5000	1877
Tl-208	0.835	5000	5990
U-233	12.876	5000	388
U-234	2.686	5000	1861
U-235	7.171	5000	697
U-236	1.328	5000	3766
U-238	2.664	5000	1877

## Exhibit C

**Comparison of Maximum Surface Contamination Goals for External Exposures in Reg. Guide 1.86 to the USEPA Building Preliminary Remediation Goals (BPRGs) for External Exposures**

<b>Radionuclide</b>	<b>EPA Building Preliminary Remediation Goals Converted to dpm/100 cm<sup>2</sup></b>	<b>RG 1.86 Max (dpm/100 cm<sup>2</sup>)</b>	<b>How Many Times Higher (Less Protective) are the RG 1.86 Max Values than EPA's BPRGs?</b>
Ac-227	11.566	300	26
Ac-228	1.328	15000	11299
Am-241	5.883	300	51
Bi-212	2.287	15000	6560
Bi-214	3.219	15000	4660
Co-60	1.274	15000	11771
Cs-137	11.211	15000	1338
Eu-152	1.738	15000	8629
Eu-154	2.056	15000	7297
Pb-212	2.129	15000	7046
Pb-214	2.708	15000	5538
Pu-238	2.686	300	112
Pu-239	7.171	300	42
Pu-240	1.328	300	226
Ra-226	2.686	300	112
Sr-90	3085800	3000	0.001
Th-228	2.129	300	141
Th-230	2.686	300	112
Th-232	1.328	3000	2260
Th-234	2.664	15000	5631
Tl-208	0.835	15000	17970
U-233	12.876	15000	1165
U-234	2.686	15000	5584
U-235	7.171	15000	2092
U-236	1.328	15000	11299
U-238	2.664	15000	5631



## Exhibit D

**Comparison of Dust/Removable Contamination Goals in Reg. Guide 1.86  
to the USEPA Building Preliminary Remediation Goals (BPRGs)**

<b>Radionuclide</b>	<b>EPA Building Preliminary Remediation Goals [BPRGs] (dpm/100 cm<sup>2</sup>)</b>	<b>RG 1.86 Limit (dpm/100 cm<sup>2</sup>)</b>	<b>How Many Times Higher (Less Protective) are the RG 1.86 Values than the EPA BPRGs?</b>
Ac-227	0.068	20	294
Ac-228	0.092	1000	10880
Am-241	0.044	20	460
Bi-212	6.793	1000	147
Bi-214	0.014	1000	72420
Co-60	1.259	1000	794
Cs-137	1.492	1000	670
Eu-152	1.015	1000	986
Eu-154	2.045	1000	489
Pb-212	0.932	1000	1073
Pb-214	0.014	1000	72536
Pu-238	0.011	20	1802
Pu-239	0.041	20	490
Pu-240	0.021	20	947
Ra-226	0.013	20	1543
Sr-90	0.513	200	390
Th-228	0.093	20	215
Th-230	0.012	20	1693
Th-232	0.024	200	8420
Th-234	0.011	1000	87636
Tl-208	3.219	1000	311
U-233	0.055	1000	18311
U-234	0.012	1000	86792
U-235	0.047	1000	21248
U-236	0.023	1000	44162
U-238	0.011	1000	89553

## Exhibit E

## Conversion of USEPA Building Preliminary Remediation Goals (BPRGs) from pCi/cm<sup>2</sup> to dpm/100 cm<sup>2</sup>

Radionuclide	External		Dust	
	EPA Building Preliminary Remediation Goals [BPRGs] in pCi/cm <sup>2</sup>	EPA Building Preliminary Remediation Goals Converted to dpm/100 cm <sup>2</sup>	EPA Building Preliminary Remediation Goals (pCi/cm <sup>2</sup> )	EPA Building Preliminary Remediation Goals Converted to dpm/100 cm <sup>2</sup>
Ac-227	0.0521	11.566	0.000306	0.068
Ac-228	0.00598	1.328	0.000414	0.092
Am-241	0.0265	5.883	0.000196	0.044
Bi-212	0.0103	2.287	0.0306	6.793
Bi-214	0.0145	3.219	0.0000622	0.014
Co-60	0.00574	1.274	0.00567	1.259
Cs-137	0.0505	11.211	0.00672	1.492
Eu-152	0.00783	1.738	0.00457	1.015
Eu-154	0.00926	2.056	0.00921	2.045
Pb-212	0.00959	2.129	0.0042	0.932
Pb-214	0.0122	2.708	0.0000621	0.014
Pu-238	0.0121	2.686	0.00005	0.011
Pu-239	0.0323	7.171	0.000184	0.041
Pu-240	0.00598	1.328	0.0000951	0.021
Ra-226	0.0121	2.686	0.0000584	0.013
Sr-90	13900	3085800.000	0.00231	0.513
Th-228	0.00959	2.129	0.00042	0.093
Th-230	0.0121	2.686	0.0000532	0.012
Th-232	0.00598	1.328	0.000107	0.024
Th-234	0.012	2.664	0.0000514	0.011
Tl-208	0.00376	0.835	0.0145	3.219
U-233	0.058	12.876	0.000246	0.055
U-234	0.0121	2.686	0.0000519	0.012
U-235	0.0323	7.171	0.000212	0.047
U-236	0.00598	1.328	0.000102	0.023
U-238	0.012	2.664	0.0000503	0.011

## Exhibit F

**EPA Risk Estimate for Building Contamination at  
RG 1.86 Concentrations (External)**

<b>Radionuclide</b>	<b>RG 1.86 Average (dpm/100 cm<sup>2</sup>)</b>	<b>Risk</b>
Ac-227	100	8.63E-06
Ac-228	5000	3.77E-03
Am-241	100	1.70E-05
Bi-212	5000	2.18E-03
Bi-214	5000	1.56E-03
Co-60	5000	3.92E-03
Cs-137	5000	4.46E-04
Eu-152	5000	2.88E-03
Eu-154	5000	2.34E-03
Pb-212	5000	2.35E-03
Pb-214	5000	1.85E-03
Pu-238	100	3.71E-05
Pu-239	100	1.39E-05
Pu-240	100	7.53E-05
Ra-226	100	3.71E-05
Sr-90	1000	3.25E-10
Th-228	100	4.69E-05
Th-230	100	3.71E-05
Th-232	1000	7.53E-05
Th-234	5000	1.87E-03
Tl-208	5000	5.99E-03
U-233	5000	3.88E-04
U-234	5000	1.86E-03
U-235	5000	6.98E-04
U-236	5000	3.77E-03
U-238	5000	1.87E-03

## Exhibit G

**EPA Risk Estimate for Building Contamination at  
RG 1.86 Concentrations (External)**

<b>Radionuclide</b>	<b>RG 1.86 Max (dpm/100 cm<sup>2</sup>)</b>	<b>Risk</b>
Ac-227	300	2.59E-05
Ac-228	15000	1.12E-02
Am-241	300	5.10E-05
Bi-212	15000	6.55E-03
Bi-214	15000	4.67E-03
Co-60	15000	1.17E-02
Cs-137	15000	1.34E-03
Eu-152	15000	8.63E-03
Eu-154	15000	7.03E-03
Pb-212	15000	7.04E-03
Pb-214	15000	5.55E-03
Pu-238	300	1.12E-04
Pu-239	300	4.19E-05
Pu-240	300	2.26E-04
Ra-226	300	1.11E-04
Sr-90	3000	9.75E-10
Th-228	300	1.41E-04
Th-230	300	1.11E-04
Th-232	3000	2.26E-03
Th-234	15000	5.61E-03
Tl-208	15000	1.78E-02
U-233	15000	1.17E-03
U-234	15000	5.58E-03
U-235	15000	2.09E-03
U-236	15000	1.12E-02
U-238	15000	5.62E-03



## Exhibit H

**EPA Risk Estimate for Building Contamination at  
RG 1.86 Concentrations (Dust/Removable)**

<b>Radionuclide</b>	<b>RG 1.86 Limit (dpm/100 cm<sup>2</sup>)</b>	<b>Risk</b>
Ac-227	20	2.94E-04
Ac-228	1000	1.08E-02
Am-241	20	4.60E-04
Bi-212	1000	1.47E-04
Bi-214	1000	6.99E-02
Co-60	1000	7.95E-04
Cs-137	1000	6.70E-04
Eu-152	1000	9.86E-04
Eu-154	1000	4.89E-04
Pb-212	1000	1.07E-03
Pb-214	1000	6.99E-02
Pu-238	20	1.80E-03
Pu-239	20	4.90E-04
Pu-240	20	9.46E-04
Ra-226	20	1.64E-03
Sr-90	200	3.91E-04
Th-228	20	2.14E-04
Th-230	20	1.69E-03
Th-232	200	8.41E-03
Th-234	1000	8.40E-02
Tl-208	1000	3.11E-04
U-233	1000	1.81E-02
U-234	1000	8.31E-02
U-235	1000	2.10E-02
U-236	1000	4.31E-02
U-238	1000	8.57E-02

## Exhibit I

Conversion From dpm/100 cm <sup>2</sup> to pCi/cm <sup>2</sup>						
Radionuclide	RG 1.86 Average (dpm/100 cm <sup>2</sup> )	pCi/cm <sup>2</sup>	RG 1.86 Max (dpm/100 cm <sup>2</sup> )	pCi/cm <sup>2</sup>	RG 1.86 Dust (dpm/100 cm <sup>2</sup> )	pCi/cm <sup>2</sup>
Ac-227	100	0.450	300	1.351	20	0.090
Ac-228	5000	22.523	15000	67.568	1000	4.505
Am-241	100	0.450	300	1.351	20	0.090
Bi-212	5000	22.523	15000	67.568	1000	4.505
Bi-214	5000	22.523	15000	67.568	1000	4.505
Co-60	5000	22.523	15000	67.568	1000	4.505
Cs-137	5000	22.523	15000	67.568	1000	4.505
Eu-152	5000	22.523	15000	67.568	1000	4.505
Eu-154	5000	22.523	15000	67.568	1000	4.505
Pb-212	5000	22.523	15000	67.568	1000	4.505
Pb-214	5000	22.523	15000	67.568	1000	4.505
Pu-238	100	0.450	300	1.351	20	0.090
Pu-239	100	0.450	300	1.351	20	0.090
Pu-240	100	0.450	300	1.351	20	0.090
Ra-226	100	0.450	300	1.351	20	0.090
Sr-90	1000	4.505	3000	13.514	200	0.901
Th-228	100	0.450	300	1.351	20	0.090
Th-230	100	0.450	300	1.351	20	0.090
Th-232	1000	4.505	3000	13.514	200	0.901
Th-234	5000	22.523	15000	67.568	1000	4.505
Tl-208	5000	22.523	15000	67.568	1000	4.505
U-233	5000	22.523	15000	67.568	1000	4.505
U-234	5000	22.523	15000	67.568	1000	4.505
U-235	5000	22.523	15000	67.568	1000	4.505
U-236	5000	22.523	15000	67.568	1000	4.505
U-238	5000	22.523	15000	67.568	1000	4.505